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cover story

On a Diet

". . . on a diet" is probably one of the most common three-word phrases heard in any conversation today. Many people carry excess weight on their bodies, and many practice dieting in order to achieve an ideal body conformation. But some investigators say that everybody has a basic body type that limits the extent to which he can achieve the popularized "ideal" physique for his sex. Many diet for medical reasons. Yet social factors are equally, if not more, important in explaining motivation for dieting. The first digest in this issue explores some of those social factors in a discussion of the social psychology of dieting.

mental health digest

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The Social Psychology of Dieting

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The prevalence of excess weight in the American population is high—in fact, in some segments of the population it has reached epidemic proportions.

Dieting is a popular American avocation. Because the reduction to or maintenance of weight at normal levels can result in decreased risk and severity of certain diseases, weight control has medical significance. However, since social factors are equally, if not more, important, one must understand the social psychology of dieting.

Overweight—Overweight is defined as body weight in excess of an ideal weight, based on height and sex specific standards. It can result from excesses of bone, muscle, fat, or rarely, fluid. Almost everyone who is more that 20 percent overweight is overfat, or obese.

Obesity—Obesity is defined as body fatness in excess of age and sex specific standards and body weights are indicative of obesity. Moderate overweight sometimes is due to obesity; some people whose weights are normal are also obese. Thus, overweight (heaviness) and obesity (excessive fatness) are not necessarily synonymous, and weight deviations give only imprecise estimates of obesity. Football players may be overweight because of their massive bone and muscle structure, yet not be overfat.

Body type—Somatotypes, which describe differences in physical conformation and structure between persons, are important in the study of weight deviations. These variations in appearance are due, in part, to underlying anatomical differences in the amount, distribution, or conformation of fat, muscle, and bony tissue reflected in body form. These variations have been described: (1) endomorphy, characterized by softness and roundness of appearance; (2) mesomorphy, characterized by a combination of bone and muscle development; and (3) ectomorphy, characterized by linearity, fragility, and attenuation of body build. Common somatotypes combine all three of these components to varying degrees.

Most obese persons are not simply thin persons with an excessive body burden of fat; their body types differ as well. Most tend to be larger in their bone and muscle components as well as fatter than their nonobese counterparts. Different weight goals are necessary for persons of different body types to allow for variations in relative contribution of the nonfat components to their weights.

Dieting—"Dieting" covers a multitude of different types of eating behavior. Some persons "diet" when they substitute noncaloric sweeteners for sugar; others subject themselves to a total fast. In this article, few attempts were made to identify the types of changed eating habits categorized as dieting. All that can be inferred from statements that respondents were "on diets" is that they changed their usual food intake to lose weight, however effective or extensive their efforts may have been.

Prevalence of Obesity

The prevalence of obesity varies with age, sex, probably socioeconomic class, and perhaps ethnic variables. The percentage of persons who are

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obese (20 percent or more above ideal weight) generally rises with age from early childood until late in life, so more adults than children are obese. Sex differences do not appear until adulthood. Men gain more weight with age during their early 20's; by the end of their 30's more men are obese or overweight than women. Women achieve maximum weights about two decades later than men and have a greater relative gain with age, so that by early middle age the proportion of obese women exceeds that of men. By late middle age many more women are obese than men; this may be due in part to obese men dying in greater numbers than obese women or nonobese men.

Prevalence apparently varies somewhat by socioeconomic class. In a study of whites in midtown Manhattan, as social class rose, the prevalence of obesity decreased, particularly among women. In adolescents, associations between obesity and social class appear to be weaker.

Occasionally racial differences have been mentioned, suggesting that prevalence among Negro women is higher than among white women. Differences among men are not as pronounced and suggest a slightly higher prevalence among white men. However, racial differences are usually confounded with socioeconomic class so that it is difficult to say whether racial differences exist.

Prevalence of Concern About Weight and Dieting Behavior

Age—Excessive weight deviations tend to be more common and severe among adults than adolescents, yet adults are less concerned and less apt to take remedial measures. A poll conducted in 1964 revealed that over 30 percent of adults who had a weight problem were not concerned. Only about 10 percent of the adults with weight problems were dieting, about 20 percent were watching their weights, and the rest took no action. Another poll showed that concern with weight in adults rarely led to dieting. In contrast, almost all obese and many nonobese adolescents are concerned about weight and engage in remedial efforts more often than adults.

Sex—Sex differences in concern about weight favor females, although the prevalence of obesity is not always higher and, in some age groups, may be lower than in males.

Polls in 1956 found that 45 percent of adult women and 22 percent of adult men wanted to lose weight, and that 14 percent of the women and 7 percent of the men were on diets. Polls in 1966 showed that 42 percent of the women and 35 percent of the men felt they were over their best weights; 14 percent of the women and 6 percent of the men claimed that they were trying to lose weight. While concern with weight appeared to be rising among the men, dieting was not.

In one study, 16 percent of the girls and 19 percent of the boys had triceps skinfolds classified as obese. Over 80 percent of the girls but less than 20 percent of the boys wanted to weigh less than they did. Among twelfth-grade, upper-middle-class New England girls, over 60 percent of the girls had dieted by the time they were seniors in high school, and 30 percent were on reducing diets on the day they were questioned. Only 16 percent of all the girls were obese; all obese girls had dieted, and many leaner girls as well. Of boys in the same high schools, only 24 percent had ever dieted, and only 6 percent were on reducing diets on the day they were questioned. Nineteen percent were obese, but few of them were on a reducing diet.

Weight status—Heavier people tend to be more concerned about weight than lighter people. Almost all of the studies relevant to this point, however, have been done on adolescents; little work has been done on adults.

Social class and ethnicity—Dieting and concern with overweight seem to be more prevalent among upper-class adults, although there are fewer obese persons in the upper classes. Only 11 percent of the population falls in the upper or upper-middle-class brackets, which contain 24 percent of all dieters. Analyses of opinion polls showed that concern with weight and dieting behavior increased slightly with occupational status but not educational level in men, and with both education and occupation in women. A greater proportion of overweight upper-class women saw themselves as overweight and attempted to lose than did lower-class women.

The Chain of Decisions Leading to Dieting

The sequence of events that may result in dieting are (1) recognition of a weight problem; (2) decision to remedy it; (3) choice of treatment source; and (4) choice of treatment method. Each offers several options, so that decisions and actions may vary considerably at each step.

The decision that one is too fat—Before he is likely to engage in dieting behavior, the potential dieter must realize that he has a weight problem. Equally obese people often differ in their opinions about their body weights, and membership in social and cultural groups may cause people to vary the attention and importance they place on weight. Individuals differ in their exposure to sources of information that might make them perceive that they are too fat, and they vary in interest and concern about fatness and appearance.

Various types of standards are used for the assessment of fatness. Standards used by physicians, other health workers, and many laymen are tables of ideal or desirable weights for each height, frame, and sex. The tables have been derived by insurance companies from actuarial studies and are based on health considerations. However, these tables have severe shortcomings—the most germane problem being that no specifications are given of what is meant by "frame."

If overweight due to large amounts of bone and muscle is mistaken for obesity, it may lead to misdirected and fruitless dieting. While diet and exercise can reduce weight due to extra fat, it is impossible to reduce bone and muscle components of weight by these measures. Conversely, if overweight due to excessive fatness is wrongly identified as due to a large build, no action may be taken against obesity. Ideal weights for persons of certain builds, particularly for those with large endowments of muscle and bone, may be unrealistically low as weight goals for the general population.

One simple way of assessing body fatness is to measure the size of the triceps skinfold, the subcutaneous fat depot over the triceps muscle on the back of the upper arm. This gives a reasonably satisfactory estimate of the total body burden of fat, and standards for obesity based on this measurement have been established. A slightly more complicated method is the "body envelope method" based on several physical measurements.

Many laymen rely on standards based on appearance or social acceptability. But is there any regularity or consistency in aspects of physical appearance related to weight that are aspired to? If so, how stable are they?

Obviously, if ideas of what is "too fat" or "too thin" change as the individual progresses through the life cycle or from year to year like fashions in dress, judgments about what is "too fat" or "too thin" may also change.

Fairly uniform, implicit norms for body appearance do exist. While they vary from person to person, these norms are quite consistent. They are probably based on collective observation of what is common in the community, coupled with an unconscious judgment about what is normal. Norms for certain aspects of appearance are regarded as unattainable for some; e.g., if the norm is that American women should be about 5′6″ tall, a 5′1″ woman will be regarded as short. Other norms, such as lack of obesity, are regarded as attainable by all. While aberrations or striking deviations may not be regarded as abnormal or pathological from a medical standpoint, society's judgment that they are not "normal," may generate concern and discomfort in the individuals who possess such characteristics.

Just as fashions in clothes vary, norms and ideals for bodily appearance change from culture to culture and over time. Arabs esteem plumper body types than do Americans. During the late Renaissance, a young woman with wide hips and ample expanse of abdomen regarded herself as beautiful, while her 20th-century American counterpart abhors these characteristics. There is no reason to assume that the current ones will last forever. Slimness may remain in vogue, or it may be replaced by a more amply padded figure. Such shifts could affect the prevalence of concern over weight and dieting.

Almost no work has been done on adult norms or ideals for weight, although a few studies have been done on adolescents. Adolescent weight aspirations appear to vary with sex, body fatness, weight, and perhaps race. One study explored weight goals among high school seniors in a New England suburb. Among the girls, weights they thought were the best on the basis of health decreased with decreasing body fatness and were lower than their actual weights, except for the leanest girls, who felt that they should weigh a few pounds more. When the same girls were asked what they wished to weigh taking all considerations into account, weights were even lower. The situation was different for boys: Both weight goals were higher than actual weights. Another study reported racial as well as sex differences in desires for body weights for high school sophomores. Caucasian girls wanted to lose more weight than Negroes or Orientals, although Negro girls were heavier. Boys of all races wanted to weigh more and to be taller. Oriental boys, the lightest and shortest, wished the greatest increases in weight and height.

Within each sex adolescents have fairly uniform ideals for the relative size of body parts, and these may influence their weight goals. Studies suggest that boys wish to gain weight and to be large in almost all dimensions, especially in those that might signify strength or athletic prowess, such as the upper torso or arms. Girls have different concerns about their bodies; they wish to be smaller, especially in their torsos (with the exception of busts) and thighs. It appears that adolescent girls attribute their overweight to overfatness and regard it as undesirable; boys attribute their overweight to build components other than fat and regard it as desirable.

A great deal of confusion exists between what norms are attainable

and what are unattainable. It is thus crucial to ascertain how realistic weight-related norms are and how much hope of fulfillment they offer. Clearly, the feminine ideal of a slender, full-bosomed fashion models' build and the masculine ideal of the barrel-chested, muscle-bound football player are only realizable for a small percentage of the population.

The decision to lose weight—After the potential dieter has realized that he is too fat, he must be motivated to undertake a weight control program. Factors encouraging people to follow through involve more than health motivations.

Among adults, fear of poor health is the primary, but not the only, reason given by men who undertake reducing diets. Other reasons such as appearance appear to be equally if not more important in motivating women to lose weight. In adolescent girls, the desire to change appearance or become more attractive is almost universally the primary reason for dieting; on the other hand, boys embarked on reducing diets primarily to improve their physical fitness and sports ability.

Many Americans decide to lose weight because of the pervasive negative attitudes toward obesity that permeate the social climate. Obesity is regarded as more than a health issue, not only by the afflicted individuals, but even by physicians and other members of society. Obesity evokes negative stereotypes about behavior personality traits and appearance, and most Americans regard obesity as a socially deviant form of physical disability. Subjects in one study blamed the obese for being fat, but felt that persons with other physical handicaps were not responsible for their conditions. The authors expected certain groups, notably low-income subjects, Negro males, and elderly persons to be indifferent to the American preference for leanness. However, members of these groups considered fat persons less likeable than nonfat ones. Some members of society look upon obesity as immoral, apparently basing such judgments on the belief that it arises from gluttony and sloth.

Obesity evokes negative and stereotyped attitudes as early as childhood. Boys from 4 to 10 years of age were asked to assign behavior or personality traits to silhouettes representing extremely endomorphic, mesomorphic, and ectomorphic types. Stereotyped responses began to appear between the ages of 4 and 5 and were definitely apparent by age 7. At age 7, traits assigned to the endomorph with a greater frequency than to the other silhouettes were socially unfavorable (e.g., fighting, cheating, mean, lazy), those assigned to the mesomorphic were favorable (e.g., strong, best friend, clean), and those to the ectomorph were personally unfavorable or indicative of social submissiveness (e.g., sneaky, afraid, quiet). After age 7 children liked the mesomorph better and were able to classify their own body types.

Professional persons trained to regard physical problems dispassionately might be expected to be free from stereotyped beliefs. However, a study revealed that negative evaluation and characterization of obese persons extended to doctors' attitudes. Obese patients were described by their doctors as being more weak-willed, ugly, and awkward than their other patients. The obese accept more blame and feel more guilt about their condition than those with other types of physical disabilities, and perhaps this is due in part to physicians' attitudes toward them.

Obesity may affect interpersonal relationships even in childhood. Grade

school children indicated the greatest social distance from overweight children in their classes. Mesomorphic boys received the highest number of "best friend" choices, and endomorphs the fewest from their peers.

Obese children, especially girls, have social problems when they reach adolescence. Extremely obese girls have significantly fewer dates than nonobese girls. The obese are in fewer nonsport clubs, organizations, and groups in and outside of school than the nonobese. They do not participate as actively in those groups of which they are members as do the nonobese.

Another study presented evidence that unconscious prejudices of high school teachers writing recommendations or of college interviewers against obese adolescents may hinder their being accepted by the colleges of their choice. Application rates and academic qualifications among the obese were equal to those among nonobese twelfth graders in the schools, yet acceptance rates into high-ranking colleges were lower for obese students, especially for girls. It was also found that obesity did not have any effect on high school performance as measured by IQ scores, PSAT or SAT scores, absences, or enrollment in extracurricular activities. Thus it appears that the concern of the obese with weight and their own and teachers' negative evaluations of obese adolescents do not prevent them from performing well or excelling in many areas.

Our self-regard largely reflects what others think of us. Other factors being equal, persons with an attractive appearance tend to develop high self-regard, while those whose appearance is regarded as unattractive tend to have lower self-regard. It is not surprising to find that obese children and adolescents have extremely negative self-images. In a study of high school girls at a summer camp in New England, it was found that obese girls showed personality characteristics such as passivity, obsessive concern with self-image, expectation of rejection, and progressive withdrawal—all similar to the traits of ethnic and racial minority groups that are victims of prejudice. The girls also accepted the negative values toward obesity prevalent in our society, and obsession with their weights was so great that nonrelated areas became involved in the issue. In sentence-completion tests dealing with interpersonal situations, obese girls were more apt to give responses indicating concern about weight, while the responses of normal-weight controls were related to other adolescent concerns and reactions.

The disvaluation of fatness and denial of identification with the obese extended not only to the general public but to people who were themselves obese. When obese subjects were asked to compare themselves to their ideal selves and to fat people for various characteristics, their answers revealed that they felt less like their ideal selves but also less like obese people than did normal-weight subjects.

The early and prolonged exposure to negative sociocultural attitudes toward obesity encountered by those whose obesity begins in childhood appears more detrimental to self-image than does obesity of adult onset. Adults afflicted with obesity of the latter type do not approve of their overweight, but do not loathe their bodies or hate themselves because of it. Many of them deny their fatness. In contrast, certain obese adults, most of whom had been obese since childhood or adolescence, looked upon themselves as grotesque and ugly; they tended to blame their weights for far-

removed troubles, to divide the world into fat and nonfat, and to disregard factors such as talent, intelligence, and wealth in favor of appearance in judging others. It has also been observed that persons obese since early life who later reduced their weights still felt that they were ugly and fat.

Thus, from many standpoints obesity is detrimental. Many obese persons undertake weight control behavior to escape social and moral opprobrium as well as to decrease health risks.

Source of treatment—The potential dieter must decide whom to consult for help in losing weight. He may seek advice from a health professional, a lay practitioner, or he may choose to treat himself. Choice is determined by the individual's perceptions and opinions on the cause and severity of his condition. If he believes that his obesity is connected to a pathological physical or psychological condition, he is likely to seek medical or psychiatric help; if he believes that he is well and that his obesity is uncomplicated from the medical standpoint, he will treat himself or engage the services of a lay practitioner, such as the leader of a diet club. Other variables may influence his decision. In terms of economy of money, time, and effort, self-administered methods rate the highest. If we examine adequacy of medical supervision and the amount of psychological support, methods employed by lay practitioners and health professionals are superior. Persons whose obesity is severe (or who regard it as such) are more likely to choose such sources.

Choice of method—There are three basic popular methods that can be used alone or in combination: dietary modifications, increased physical activity, and medications. Dietary modifications decrease caloric intake, increased physical activity raises caloric output. Medications vary; some act as appetite depressants, others as laxatives or diuretics, and a few, such as thyroid extract, increase metabolic rate and therefore energy expenditure. Psychiatric treatment is based on the premise that solving the patient's emotional problems will motivate him to lose weight. These last two treatments are usually coupled with or result in changes in food intake or energy expenditure.

The source of treatment chosen to some extent dictates the methods. Lay practitioners are usually involved in managing diet clubs and health spas, while health professionals prescribe most medications or refer patients to dietitians for diet therapy. Choice of method is also influenced by other interrelated factors: (1) the individual's views on the cause of his obesity, (2) cost and availability of the method, and (3) compatibility with the individual's life style.

Views on the causation and proper treatment for obesity—The most common type of obesity in this country is agreed to be environmental in origin, arising from inactivity rather than from excessively large food intakes. Only a small percentage appears caused by preexisting pathological conditions, either physical or psychiatric. Most competent physicians treat most obese patients through reducing diets or increased physical activity, and they are conservative in using medications. Potent medications such as thyroid extract or "rainbow diet pills" (thyroid extract, diuretics, digitalis, and amphetamines) in combination with rigid diets have been misused by some "diet doctors"; their patients have paid high fees and may have jeopardized their health.

Lay and medical opinion on the cause and proper treatment vary. Lay opinion stresses overeating as the

major cause of obesity, and perhaps these views lead to the high value placed on dieting. For example, in a study of high school students, over half of the freshman boys and more of the girls believed that fatness was due to overeating. Less than half of both sexes realized that the obese did not exercise as much as the nonobese, but by the time students had reached the twelfth grade, boys had begun to adopt the opinion that obesity was due to underactivity.

Cost and availability—Self-administered methods are easiest, for dietary modifications and increased physical activity can be undertaken by anyone without consulting a physician, although they are often more effective under a physician or dietitian's direction. Psychiatric treatment is available only from physicians, and potent medications are available only by prescription. Some of the less powerful drugs, such as certain appetite depressants, weak diuretics, bulk producers, laxatives, and other nostrums can be obtained without prescription, but these are usually used in conjunction with dieting.

Compatibility of method with life style—The ease with which weight loss can be fitted into one's normal life is important in determing choice of method. Most people acknowledge the value of exercise and activity; but in actual weight-control efforts, they rely chiefly on dietary methods.

The unpopularity of physical activity has a more complex explanation. People think that dieting is an easier method of curing obesity than burning off calories by exercise and physical activity. Considering the relative amounts of disruption to established habits and life style, they are probably right. Patterns of inactivity probably have a stronger hold and are more difficult to overcome than habits of overeating. Increased physical activity requires a greater time input, which busy people are loathe to make, while skipping meals and eating less may save time. Special facilities, such as swimming pools, are required for many of the types of exercise people like best; other sports require teammates or other players. Many simple activities, such as walking, are difficult in areas where streets are unsafe. Finally, the disinclination to increase activity is due partly to the widely held but mistaken belief of most Americans that they are not inactive or sedentary. The majority of Americans do lead sedentary lives; they do not perform much physical labor that involves substantial energy expenditures. Inactivity and the sedentary life are confused in many peoples' minds with sloth, yet to say that a person is sedentary has no moral overtones. Americans *are* sedentary, but this does not mean that they do not engage in tiring activity; it means that most of their activity does not involve large caloric output.

Another widespread belief is that exercise, such as calisthenics, jogging, or weight lifting, must be violent and unpleasant to contribute to weight loss. While this is not true, it discourages many persons from engaging in greater physical activity. In terms of all of these variables the easiest, most pleasant, and most popular method of losing weight seems to be dieting.

At last the potential dieter has become an actual dieter, yet this gives no assurance that he will actually lose weight. The efficacy of the treatment will depend on the soundness of the regimen, the zeal with which it is followed, and its duration, Unfortunately, little has been written on the psychological factors that influence these variables, and study is needed in this area.

Possible Explanations of the Greater Rate of Dieting Among Females than Males

Several plausible reasons can be suggested for the greater rate of dieting among females:

1. Weight deviation is more of a social liability for females. If their weights are excessive, females are at a greater social disadvantage in their relationships with other females and with males, and their social mobility is inhibited to a greater extent. Successful men are often overweight or obese; successful career women and the wives of famous men rarely are.

2. Weight-related aspects of appearance are more intertwined with self-concept in females. The sensitivity of their self-images to weight problems may encourage them to undertake corrective efforts. Women know the importance of physical appearance in determining how males will regard them as well as in influencing other females' opinions. Men desire physical attractiveness in their mates and value it highly. Although appearance is an important factor in how females assess the eligibility of male partners, other considerations rank higher among the criteria. Men's concern seem largely tied to aspects of appearance that suggest physical or sexual prowess. Obesity and leanness must be severe before they become detriments or imply deficits in the area of physical performance. The self-concepts of females are more intimately involved with aspects of body appearance other than those suggesting physical prowess, and their body images are adversely affected by much smaller deviations. Similar deviations in excess weight that might be merely annoying to a male are devastating to a female's concept of herself.

3. Obesity is more visible in females than in males. Normal young mature females have almost twice as much fat as do males. Fat on females is distributed more conspicuously on the extremities, hips, and chest; men have most of their fat on their torsos and are leaner in the extremities.

4. Differences seem to exist between the sexes in mistaken notions about body composition and weight loss. Males overestimate the contributions of build to weight and are often uninterested in lowering their weights, for they believe that reducing diets will result in muscle as well as fat loss. Men undergoing weight reduction have been found to be obsessed with the thought that their loss of weight was causing physical disintegration, affecting their strength and virility. When males do diet, they seem partial to high-protein diets in combination with increased physical activity. This form of dieting, which might be labeled the "training-table mystique," has a virile aura, is in line with males' convictions that underactivity is an important cause of obesity, and conforms to cultural beliefs that males should be physically active. Unfortunately, the physical activity often degenerates into perfunctory exercise or an occasional sauna bath and massage to ease the conscience and provide the illusion of fitness.

Underestimation of the contribution to weight of build components other than fat is common in girls and women. A large number of adolescent girls diet because they mistakenly attribute their relative largeness and heaviness to fatness rather than to the other components of build. Observation of members of "Weight Watchers" and similar dieting clubs suggests that many adult women labor under similar misconceptions.

5. Fashion profoundly influences attitudes toward dieting. Since the dawn of history clothes have been influenced by three principles:

seduction, attraction of persons of the opposite sex; hierarchy, expression of personal or social superiority through clothing; and utility, protection of the body.

Male fashions have generally been dominated by hierarchy and modified by utility, with little emphasis on seduction, and most men's clothes are shapeless enough to conceal all but the most deviant body conformations.

Female fashions have been largely under control of the seduction principle, modified by utility and hierarchy. Over the past 50 years fashion has become important for almost all American women, yet clothes tend to be designed with an ideal female body type in mind. Since early in this century the slight frame has been the ideal, although emphasis has shifted from legs to bosom and back again. For the past several decades, fashions have been tailored for the tall and slim, or for the tall, narrow-hipped, wide-shouldered female figure. Women who are short, stout, or wide-hipped with narrow shoulders have difficulty dressing a la mode.

Possible Explanations for Differences in Dieting Prevalence Between Adolescents and Adults

Adolescence is a period that is particularly favorable for dieting and other weight reduction efforts for several reasons:

Adolescents are more self-conscious about their bodies. This may be due in part to the dramatic physical changes, brought about by accelerated growth during puberty. The heterogeneous nature of growth patterns accentuates physical differences and makes them noticeable. Adolescent girls mature about 2 years sooner than boys, so that by late high school they have reached their mature size and are likely to become concerned if the weights at which they have stabilized seem too high. Many boys of the same age are still growing. Even obese boys may convince themselves that their weight problems are temporary, although this is unlikely. Concerns about underweight are common among adolescents who are late maturers and are shorter and lighter than their peers. Asynchronism—for example, rapid weight gain with height gain lagging behind—is common during adolescent growth. All these physical changes occur at the time when social and cultural pressures are the strongest for homogeneity and conformity in matters of appearance as well as in many other aspects of life. Failure to attain appearance ideals can cause discontent and unhappiness among adolescents, especially among those more noticeably deviant.

Adults have more or less constant physiques and have time to accept their bodies, imperfections and all. Accordingly, obesity of adult onset usually has less severe and detrimental effects on self-image and is less likely to impel the afflicted individual to diet.

Recent experience with extensive body alterations during the adolescent growth spurt may make teenagers receptive to the idea that changes in weight are possible and encourage optimism about the success of their weight-control efforts. By comparison, adults know from experience that weight changes are difficult to achieve.

Adolescents are more physically active than adults; their physical performance is more hindered by extreme obesity. However, there are sports in which crushing power is important, and overweight may be an advantage.

The desire to conform to others and to ideals in weight, appearance, and many other aspects of life is strong during adolescence. Teenagers regard

being different as tantamount to being inferior, while adults are less likely to feel the need to conform.

Adolescent desires to demonstrate their independence may lead them to alter their eating habits, especially if their parents are opposed to the idea or manner in which they do it.

A final factor is that weight deviations among adolescents are more likely to be diagnosed and treated early. Teenagers are given yearly school medical exams, and the obese are urged to control their weight. Adults often go for years without any physical examination, and their weight deviations are likely to be more severe, established, and difficult to reverse by the time they are finally diagnosed. Even then many obese adults are not urged to take action because of their physicians' disinterest in preventive medicine or dismal experience in treating obese adults.

Variations in Dieting Prevalence Among Different Socioeconomic Groups

It has been suggested that perhaps lower-class persons do not regard obesity as undesirable as do those of higher social status, because their experiences may have led them to connect obesity with well-being and prosperity. However, every social class contains many persons who are obese, concerned about their weights, and dieting to correct them. Perhaps this is due to the fact that all are exposed to the same mass media, schools, and other factors.

Approaches for More Effective Prevention and Treatment of Obesity

Left alone, obese children and adolescents become obese adults; cure of obesity is rare once it is well established. Other persons, nonobese until adulthood, are afflicted with obesity at maturity and are never cured. Prevention or early treatment is vital if prevalence rates of obesity are to be decreased.

Moderately successful methods of weight reduction exist, but no inroads have yet been made into the high prevalence of obesity. Existing weight-reduction measures do not seem to reach enough people, are often expensive, and consume a great deal of the time of health professionals involved in treatment.

Group efforts might have more hope of success in reaching the millions of persons who require expert support and guidance, yet whose obesity does not require highly specialized medical supervision. Such group efforts have the attraction of being less expensive in terms of medical manpower and cost. The more successful group programs dealing with persons who are obese or at high risk of becoming so, might be organized on a broader scale to test their adaptability as weight-control programs on a public health basis.

Many health agencies have begun anticoronary clubs for middle-aged persons, particularly men, which combine calorie restriction with low-cholesterol, highly unsaturated fat diets designed to decrease weight as well as serum cholesterol. Most of these groups encourage exercise, and some provide sport facilities and organized classes; others also discourage smoking. Such clubs are quite popular, and their methods do seem to decrease risks of heart attacks.

The past few years have marked the spread of "Weight Watchers" and similar clubs for reducing; most are private, profit-making organizations. Reducing diets prescribed are usually a standardized low-calorie diet of roughly 1200 calories; strict adherence to the choice of foods and weighing of portions is required. Many people are

losing weight through such clubs, whose techniques contain elements of group support and group therapy that might be adopted more widely. Members are usually friends or acquaintances, thus lending to meetings a spirit of camaraderie and good-natured competition. Meetings are partly social, partly business; members are weighed, exhorted to follow the club's diet, and given hints and low-calorie recipes.

It appears that many American women are amenable to this type of program. However, the clubs have two failings: In some States they are outside the realm of supervision by knowledgeable physicians or health agencies so that they are difficult to monitor. Second, the major qualification for the instructors is that they have reduced successfully and are good leaders, but they are given no training in nutrition or the other health sciences. They often have given fallacious information on nutrition and weight control to members who regard it as authoritative. Unfortunately, the instructors' well-intentioned efforts to explain why their diet works are usually derived from the pseudoscientific theories written by quacks.

There is an urgent need to educate these instructors in the rudiments of scientific nutrition, with emphasis on energy balance, energy metabolism, and weight control. Deficits in club programs, however, should not discourage nutritionists and other health professionals from adopting their more positive characteristics in designing weight-control programs tailored to fit the needs of the community.

Implementation of widespread weight-control programs seems far off. One shortcoming is that many of them possess the disadvantage of being curative rather than preventive. Attempts to organize weight-control programs among adults run into the problem that adults are difficult to assemble on a regular, frequent basis. Children are more accessible, and school-based group approaches to preventing obesity in children offer great promise.

The first objective of school programs should be the improvement of nutrition education with regard to obesity. Inservice courses in nutrition, with emphasis on weight control in the context of adolescent development, as well as more coordination between different teachers whose subjects touch on nutrition, are needed to improve the quality and presentation of weight-control-related topics.

A second objective should be to increase the efforts of school health personnel in combating overweight. Periodic screening procedures should be instituted to enable early diagnosis. Presently a few school health nurses and physicians can assist students in weight-control measures and supervise dieting efforts. Part-time nutritionists could help in such efforts by prescribing therapeutic diets and assisting students. At the least, there should be an adequate referral system to alert parents and family physicians to the problem, and school cafeteria managers could demonstrate and encourage sensible dieting by serving special low-calorie lunches to those who wished them.

The third objective should be to improve physical education programs. Schools can intervene in matters relating to the activity component of overweight, since most of them have compulsory physical education classes and extracurricular athletic programs, yet most physical education programs cater to the physically fit rather than to the unfit. Obese youngsters are inactive and sensitive about their clumsiness. Inservice instruction about

the needs of the obese is needed for physical education teachers, and extended departmental programs are needed to furnish classes adapted to the handicaps of the obese.

Even if programs to control obesity were instituted in schools, we would be far from solving the obesity problem, since we would not have reached the millions of obese adults. However, this would be a good beginning and investment in the health of the adults of tomorrow. A "spin-off" effect might be to excite interest in weight reduction in the children's parents.

Another means to encourage weight control among large groups of people would be development of low-calorie, high-nutritive-value foods that are tasty, safe, and competitively priced. Such products would allow dieters to maintain satisfactory nutritional status while they eat food that looked and tasted good.

A final approach is the improvement of facilities for exercise and the development of physical activity programs for adults.

Hopefully this review will not only shed light on the epidemiology of weight-loss behavior, but will also stimulate better teaching and counseling plus more effective treatment and prevention of obesity.

Behavior Modification in the Treatment of Obesity

Sydnor B. Penick, Ross Filion, Sonja Fox, and Albert J. Stunkard

Current interest in behavior modification and its effectiveness in the control of several conditions rendered inevitable its application to problems of overeating and obesity.

Assessment of behavior modification was carried out in a day-care program for the treatment of obesity. Treatment lasted for 3 months and was carried out once a week for about 4½ hours. Activities consisted of an exercise period, a low calorie lunch, and group therapy.

Thirty-two patients, all at least 20 percent overweight, comprised the study group. Median overweight of patients treated by behavior therapy was 78 percent; that of the control patients was 80 percent. Median age of the behavior therapy patients was 39; that of the control group was 44.

Two cohorts were studied, the first composed entirely of private patients, the second containing also rehabilitation patients. Patients from each source were randomly assigned to either a behavior therapy or a control group.

Therapy of both groups lasted about 2 hours and was carried out by a man-and-woman team. The control group received supportive psychotherapy, instruction about dieting and nutrition and, upon demand, which was infrequent, appetite suppressants.

The behavioral program involved four general principles:

1. *Description of the behavior to be controlled.* Patients were asked to keep daily records of amount, time, and circumstances of their eating. Each patient reluctantly acknowledged that keeping records proved helpful in increasing awareness of how much he ate, the speed with which he ate, and the large variety of environmental and psychologic situations associated with eating.

2. *Modification and control of the discriminatory stimuli governing eating.* Most of the patients reported that their eating occurred in a variety of places and at different times during the day. They were encouraged to confine their eating, including snacking, to one place.

3. *Development of techniques which control the act of eating.* Specific techniques were utilized to help patients decrease the speed of their eating, to become aware of the various components of the eating process, and to gain control over these components. Exercises included counting each mouthful of food eaten during a meal, and placing utensils on the plate after every third mouthful until that mouthful was chewed and swallowed.

4. *Prompt reinforcement of behaviors which delay or control eating.* A reinforcement schedule, utilizing a point system, was devised for control of eating behavior. Exercise of the suggested control procedures during a meal earned a certain number of points; devising an alternative to eating in the face of strong temptation earned double this number of points. Points were converted into money which was brought to the next meeting and donated to the group. The group decided how the money should be used.

In addition to positive reinforcement, negative reinforcement was utilized. For example, control over snacking was facilitated by "doctoring"

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favorite snack foods with castor oil or other aversive taste. Failure to exercise control resulted in the loss of points.

Our program differed from previous behavioral methods in at least two ways: (a) infrequent weighings and (b) separate reinforcement schedules for exercise of self-control and for weight loss.

The primary objective of this program was the development of self-control of eating; weight loss was considered a consequence of the adaptive behaviors resulting from self-control. Separate reinforcement systems were established for self-control and for weight loss.

Weight losses in the control group are comparable to those reported in the medical literature; none lost 40 pounds, and 24 percent lost more than 20 pounds. By contrast, 13 percent of the behavior modification group lost more than 40 pounds, and 53 percent lost more than 20 pounds. Although neither difference between behavior modification and control group for weight losses of over 20 and 40 pounds is statistically significant, that for weight losses of over 30 pounds is.

In each cohort median weight loss for the behavior modification group was greater than that of the control group—24 versus 18 pounds for the first cohort and 13 versus 11 pounds for the second. Another finding was the greater variability of the results of the behavior modification groups.

Followup of the two cohorts at 6 and 3 months showed continuing influence of treatment. The number of persons in the behavior modification group who lost more than 40 pounds doubled after termination of treatment, and three lost more than 50 pounds. The control group similarly showed an increase in persons losing large amounts of weight, a finding which attests to the effectiveness of this treatment. The median weight losses of the groups again showed differences favoring behavior modification: 18.5 versus 13.5 pounds for the first cohort and 22 versus 15 pounds for the second cohort.

This study showed that behavior modification was more effective in the treatment of obesity than was the best alternate program devised by an internist with long experience in the treatment of this disorder.

The major limitation of this study was the use of different therapists as well as different therapies, and the second possible limitation of the study was that the day hospital setting may have had differential effects upon the behavior modification and supportive psychotherapy groups.

The results of the behavior modification groups were far more variable than those of traditional group therapy programs, with individual patients performing both more and less effectively than those of the traditional therapy groups. Available data were insufficient to distinguish responders to behavior modification from nonresponders. The development of predictors of response to behavior modification, in combination with replication of the current findings, could mean a significant advance in the treatment of obesity.

Male Versus Female Discussion Leaders

NORMAN R. F. MAIER

In listening to tape recordings of simulated problem-solving discussions led by male and female leaders it is difficult to avoid making sex comparisons of leadership. The impression I had gained is that females are less inclined to be committed to a solution, but when committed, they seemed to be as persistent as male leaders in achieving their objective.

Problem situations can be structured so that a solution is supplied along with the facts or so that only the facts are supplied. If the task is easy, the same solution might be perceived in both instances. In the first instance, the solution would have some authenticity in that it is supplied and appears adequate; in the second, a solution might be suggested by the facts but its authenticity would depend on the leader's self-confidence.

According to our hypothesis, the styles of males should vary less than females between these two conditions. Females should have confidence in a solution supplied to them, but should be less sure of one they suggest. Leader dominance should be revealed by both males and females when the solution is supplied, but only males should reveal a similar degree of dominance when the solution is not supplied.

Students enrolled in introductory psychology were used as subjects; 384 students, half of them male, the other half female, were divided into 96 groups consisting of two males and two females. Four problem-solving conditions were tested; each condition included 24 groups.

The Changing Work Procedure problem was used. It is a role-playing situation in which a foreman attempts to get three workers to change their work method. Since the workers resist the change, a conflict arises. Three types of outcome are possible: the workers successfully resist the change; the leader succeeds in getting his solution adopted; the conflict is resolved and a new alternative is generated.

The groups were told that they work on a job assembling fuel pumps. Gus is foreman, and Jack, Walt, and Steve work at three positions in an assembly line, each adding his parts to the casting. The groups were asked to adopt the roles assigned, with females playing the part of males. In addition to the briefing, specific role instructions were given to each participant. The instructor indicated that he would give the signal when Gus was to join his three workers for the discussion.

The roles for Jack, Walt, and Steve were the same for all four conditions. They (1) indicated the need for changing positions to reduce boredom; (2) planted the fear of rate cuts if production increases; (3) mentioned the dangers of speedups; (4) revealed a dislike of the timestudy men; (5) supplied some awareness of differences in ability among them; (6) indicated satisfaction with one another and willingness to help a slow worker.

There were two roles for Gus. In the Standard role, Gus was given the facts and a rather obvious solution was suggested. In the Facts Only role, Gus was given the factual information, but the solution was not supplied. One male and one female leader were given the Standard role and one male

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and one female leader were given the Facts Only role.

Role for Gus Thompson, Foreman (Standard Condition)

"You are the foreman in a shop and supervise the work of about 20 men. Most of the jobs are piece rate jobs and some of the men work in teams and are paid on a team piece rate basis. In one of the teams, Jack, Walt, and Steve work together. Each does one of the operations for an hour and then they exchange, so that all men perform each of the operations at different times. The men themselves decided to operate that way and you have never given the plan any thought.

"Lately, the methods man has been around and studied conditions in your shop. He timed Jack, Walt, and Steve on each of the operations and came up with the following facts:

	Operating time (in minutes) Positions			
	1	2	3	Total
Jack	3	4	4½	11½
Walt	3½	3½	3	10
Steve	5	3½	4½	13
			Total minutes	34½

"He observed that with the men rotating, the average time for all three operations would be one-third of the total time or 11½ minutes per complete unit. If, however, Jack worked in the number 1 spot, Steve in the number 2 spot, and Walt in the number 3 spot, the time would be 9½ minutes, a reduction of over 17 percent. Such a reduction in time would amount to a saving of more than 80 minutes. In other words the lost production is about the same as that which would occur if the men loafed for 80 minutes in an 8-hour day. If the time were used for productive effort, production would be increased more than 20 percent.

"This made pretty good sense to you so you decided to take up the problem with the men. You feel they should go along with any change in operation that is made."

Role for Gus Thompson, Foreman (Facts Only Condition)

The first two paragraphs and the timestudy data were the same. However, the portion in italics was deleted and the following substituted:

"You found these data interesting and the question of whether they might suggest a way to increase production naturally occurred to you. Therefore, you have decided to take up the problem with the men. You feel they should go along with any change that is made."

Types of Decisions

The decisions can be classified into three types:

Rotation method continued. This includes all solutions in which the three workers rotate. Decisions that include additional training, better tools, a new timestudy, and agreements to try harder are classified into this type. These decisions represent victories for the workers.

Each work at a fixed position. This is the decision that is supplied in the Standard condition. Decisions that do away with rotation, but include rest pauses, music, or other benefits are classified into this type. These solutions represent victories for the foreman.

Integrative solutions. Decisions that resolve the conflict are not obvious and must be generated. They include the following: (a) Jack and Walt rotate Positions 1 and 3, while Steve stays on Position 2, (b) all rotate between their two best positions, so that Steve avoids his worst position, and (c) all rotate all positions, but spend considerably more time on their best positions. They may be regarded as ways to resolve the conflict or as decisions that integrate the facts favoring the conflicting points of view.

Satisfaction Measures

All participants were asked to indicate whether production would go up, down, or stay the same as a result of the decision, and to indicate their satisfaction with the decision and with Gus as a leader.

Results

When handled by male leaders, the distribution of decisions was identical for the two versions of the problem. The leader won his solution in 54.2 percent of the groups, the men successfully resisted in 12.5 percent of the groups, and differences were reconciled in 33.4 percent of the groups.

When the solution is supplied, the female leaders have their solutions adopted by 66.7 percent of the groups, while in 20.8 percent of the groups the workers successfully resist. The distribution of decisions for the Standard version for female leaders is not significantly different from that of male leaders. However, in the Facts Only version, the leader's preferred solution is achieved as the decision in only 20.8 percent of the groups and it is successfully resisted by 41.7 percent of the groups. This distribution of decision types is significantly different from the Standard version, and different from that of the Facts Only version of the male leaders' solution.

Results demonstrate that female leaders, given a management solution to a problem, will be as persuasive and tactful as male leaders in getting a supplied solution adopted by their group members. However, when the solution is not supplied, females are less likely to have their groups adopt the management type solutions. The lack of a "planted" solution has no effect on males, whereas females become more permissive. Hence, either the workers' initial solution, or solutions that resolve the conflict (Integrative solutions) are adopted.

Whether this change in female leadership behavior is due to lack of confidence in a solution they themselves reach or to their inability to see the solution in the data cannot be determined. In general, females are poorer problem solvers than males; they are also more conservative and less inclined to take risks. If females perceive the Facts Only version as a more risky situation than the Standard version, an explanation for their decreased aggressiveness in the Facts Only version is suggested. However, the fact remains that in an unstructured situation females play a less dominant role than in a structured situation. Females appear to have less confidence in their own problem-solving ability than males.

Thyroid "Hot Spots": Their Relationship to Life Stress

HAROLD M. VOTH, PHILIP S. HOLZMAN, JEROME B. KATZ, and ROBERT S. WALLERSTEIN

Previous studies have shown that persons with thyroid gland "hot spots" —areas which are hyperavid for radioactive iodine—have certain common personality characteristics; these characteristics, in turn, are similar to those of persons who develop thyrotoxicosis. Further, the prevalence of hot spot varies considerably, the highest percentage being found in persons whose physicians believed the subjects' symptoms might be related to hyperthyroidism. Two further studies of the hot spot phenomenon are described here: Investigation of the pattern of prevalence of hot spot in various subpopulations; longitudinal studies to determine the natural history of hot spots and of persons having them. Since personality characteristics, particularly the overall adaptive-defensive style, appeared to be related to the hot spot, it seemed possible that the absence or presence of ongoing life strain might also be related to disappearance or exaggeration of the hot spot. The hot spot might reflect subliminal hyperthyroidism; a predilection for hot spots might also indicate a somatic predisposition which could be responsive to psychologic strain and could be expected to wax and wane according to severity of that strain and to progress to thyrotoxicosis under prolonged and/or severe strain.

The sample of 226 women was selected on the basis of a randomizing technique which included all socioeconomic levels and ages from 20 to 45 years.

The sample of women volunteers, aged 20 to 45 years, was recruited from church groups, secretaries, friends of subjects, and so on.

In the previous sample of female subjects who had been selected by the randomizing technique, 12 percent were found to have hot spots, and 3 percent were diagnosed as borderline diffuse hyperthyroidism.

The first volunteer group of women revealed 7 percent with hot spots, and 2.1 percent showed borderline diffuse hyperthyroidism.

There appears to be a range in the prevalence of isolated hot spots from 7 to 12 percent and of borderline diffuse hyperthyroidism from 1.2 to 3.7 percent. There seems to be a higher prevalence of both hot spots and borderline diffuse hyperthyroidism in nonvolunteer populations than in volunteer populations.

It was hypothesized that the presence of psychologic strain, irrespective of its nature, is related to the appearance of the hot spot, and that the hot spot may be a prelude to the development, under conditions of prolonged or severe strain, of clinically recognizable thyroid gland overactivity, nodular and/or diffuse.

The requirement for adaptive response usually proceeds smoothly as individuals cope with stress. There are occasions, however, when the organism is excessively strained, and such occasions are referable either to the particular nature of the stress or to the specific psychologic or biologic vulnerabilities of the individual. The meaning of a stressor to an individual will determine its idiosyncratic role as an inducer of strain. The specific stimulus condition has a specific meaning to

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the individual on the basis of previous learning and experience, or the organismic system is relatively vulnerable in the presence of that stimulus.

A total of 239 women taken from both the volunteer and nonvolunteer samples have been retested by radioisotope technique from one to four times over a period of 12 years. From this group periodic psychiatric interviews were conducted with 63 control and experimental subjects. The purpose of these interviews was to identify life experiences which may have caused our subjects to experience strain. Subjects' retrospective accounts of their lives were easily obtainable. Although they seemed to remember dates well and could easily describe how they had reacted to past experience, distortions of retrospective reports were, nonetheless, present.

To ascertain whether or not life strain bore a relationship to the radioisosotope findings, the first three authors jointly evaluated case histories and followup interviews of matched experimental and control populations and arrived at a consensus on the presence or absence of strain in the lives of each of the subjects.

To test the reliability of the strain ratings, the case studies and followup data were sent for evaluation to additional judges who were not project members. Agreement among the additional judgments and consensus of the authors was 85 percent.

To carry out the statistical analyses of the relationship between strain and radioisotope thyroid changes, decisions had to be made about the coexistence of strain and thyroid condition. Four combinations were possible: (A) thyroid change and strain, (B) thyroid change and no strain, (C) no thyroid change and no strain, and (D) no thyroid change and strain. The number of instances of each of the four conditions was recorded for the entire sample. Then the number of instances of each of the conditions (A, B, C, D) was converted to a percentage for each case, since not all cases were evaluated in the radioisotope laboratory an equal number of times. Differences among the four conditions were tested for the thyroid group in two ways. The first used scores for hot spot cases only; the second combined hot spots with cases showing borderline diffuse and thyrotoxic changes. Both analyses were significant, indicating that thyroid hot spots and/or borderline diffuse and thyrotoxic conditions are significantly associated with evidence of psychologic strain.

Findings appear to support the hypothesis that life strain bears some relationship to the appearance of hot spots; they tend to disappear during periods of minimal stress and may progress to clinical hyperthyroidism under conditions of prolonged or severe stress. Extreme personal strain was reported by all subjects who progressed on to clinical hyperthyroidism.

It is unclear whether hot spots are autonomous or under pituitary control, or whether they are related to hot nodules. It was demonstrated, however, that their fate is variable and predictable according to life strain, and that some persons with hot spots develop clinical thyrotoxicosis under prolonged or severe strain. The study suggests that hot spots are not autonomous, inasmuch as they are influenced by ongoing life strain. That a later condition (a hot nodule, nodular or diffuse thyrotoxicosis) may develop, that is autonomous of pituitary gland control and is, therefore, no longer affected by the removal of life stress and strain, is probable.

Menstrual Synchrony and Suppression

Martha K. McClintock

Many studies with animals have indicated that social groupings can influence the balance of the endocrine system. For example, pheromonal communication can produce anestrous, pseudopregnancy, or synchrony in the estrous cycles of mice. Anecdotal and indirect observations in humans have indicated that social groupings in humans may influence some aspects of the menstrual cycle. Menstrual synchrony has been reported by mothers, daughters, and sisters living together. A higher percentage of anovulatory cycles was found among college age women than older women. While this may in part be maturational, it should be noted that most of these women attended all-female schools and may represent a human parallel to the pheromonal effect in mice.

In this study subjects were 135 females aged 17–22 years—all residents of a dormitory in a women's college. Three times during the academic year, each subject was asked when her last and second to last menstrual periods had begun; thus the date of onset was determined for all cycles between late September and early April. Average duration of menstruation and dysmenorrhoea were noted. Subjects estimated how many times each week they spent time with males (i.e., riding public transportation, speaking with male professors, dating, etc.) and listed the girls with whom they spent the most time, indicating which two they saw most often.

Synchrony—Date of menstrual onset was compared for roommates and closest friends, for close friend groups, and for living groups. The people qualified as "closest friends" only if both had indicated that they saw each other most often. For roommates and closest friends, the difference between the date of onset in October for one member of the pair and the closest date of onset for the other was calculated. This difference was compared with a difference for March calculated in a similar way, but with one change: instead of choosing the closest onset dates for the pair, both onsets for March were chosen to follow the initial October onset by an equal number of cycles.

There was a highly significant increase in synchronization among roommates, among closest friends, and among roommates and closest friends combined.

Group synchrony was also investigated and the data were analyzed to verify that the decrease in difference between onset dates was a true measure of synchrony. All subjects were divided into 15 groups of close friends using the lists of close friends made by each subject. During an interview, it was stressed to each subject that her list of "close friends" should include the people she saw most often and with whom she spent most time, not necessarily those with whom she felt the closest. Only subjects who mutually listed each other were included in a group.

A mean onset date was determined for each group in October, late November, January, late February, and April. As before, each onset date being compared followed the October onset by an equal number of cycles. There was a significant decrease in

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individual differences from the group onset mean for close friend groups. The greatest decrease occurred in the first 4 months with little subsequent change.

It has been suggested that the menstrual cycles of monkeys around the equator are synchronized because each cycle is locked in phase with the moon. As the production by the pineal gland of a substance which inhibits the action of luteinizing hormone is suppressed by light, the continuous light of nights with a full moon would facilitate ovulation and induce synchrony. This suggests that the synchrony in close friend groups and among roommates might come from a light-dark pattern, perhaps with common stress periods in which the subjects stay up for a large part of the night. It would be expected that if the synchrony arose from common light dark cycles, roommates would exhibit a more significant amount of synchrony than do closest friends. The opposite trend was found.

Synchrony may result from a pheromonal interaction of suppression among close friend groups, followed by a periodic release due to the presence of males on the weekend. However, this would be insufficient to explain the synchrony which occurred among roommates and close friends, but did not occur throughout the dormitory. Some additional pheromonal effect among individuals of the group of females would be necessary. Perhaps at least one female pheromone affects the timing of other female menstrual cycles.

Another source of synchrony might be the awareness of menstrual cycles among friends. A sample taken from the dormitory indicated that 47 percent were not conscious of their friends' menstrual cycles, and, of the 53 percent who were, 48 percent were only vaguely aware.

The significant factor in synchrony is that the individuals spend time together. Whether the mechanism is pheromonal, mediated by awareness, or some other process is a question which remains open for investigation.

Suppression—Subjects were divided into two groups: those who estimated that they spent time with males, once, twice or no times per week, and those who estimated that they spent time with males three or more times per week. Those who estimated seeing males less than three times per week experienced significantly longer cycles than those of the other group whose mean cycle length corresponded with national norms. There was no significant difference in duration of menstruation itself.

The possibility that the results were confounded by a maturation factor was tested. There was no significant difference in cycle length.

Exposure to males may not be the significant factor. It may be, for example, that those with longer cycles are less likely to spend time with males. However, many subjects spontaneously indicated that they became more regular and had shorter cycles when they dated more often. Whether this is due to a pheromone mechanism has yet to be determined.

Although this is a preliminary study, the evidence for synchrony and suppression of the menstrual cycle is strong, indicating that in humans there is some interpersonal physiological process which affects the menstrual cycle.

Please, Mother, I'd Rather You Did It Yourself; Training Parents to Treat Their Own Children

Paul W. Clement

Training parents to be behavior therapists of their own children has many advantages when contrasted with traditional child psychotherapies. First, far less professional time is required for a given case, since the treatment takes less time, and one therapist can handle the whole family. Hence, a given therapist can reach a larger number of children and families in a year, and the whole treatment program is less expensive for each family. Also parents can provide multiple treatments each week, even 24 hours a day, and such procedures avoid arousing parents' suspiciousness of what is being done to or with their child.

Evidence indicates that parents notice therapeutic changes more rapidly in this treatment modality compared to traditional child therapies. Since the treatment is carried out in the home and family context, therapeutic effects are not lost through generalization phenomena upon moving from the clinic to the home. Training parents to be behavior therapists seems to increase their competence and confidence to deal with future problems; hence, the whole approach emphasizes prevention of future psychological difficulties.

Principles to Use With Mothers and Fathers

The consultant must first establish with parents their specific goals. Parents are taught how to analyze their child's behavior in terms of excesses, deficits, and assets. Once the child's behavior is classified, the general goals are to reduce behavioral excesses, to increase the frequency of desirable behaviors which occur at low rates prior to intervention, and to maintain and strengthen the behavioral assets. Next the parents list their priorities for reaching the various goals and estimate how easy it will be to achieve each of them. The consultant's task at this point is to decide which item can be most easily reached, for more important than tackling the highest priority task is working toward a goal which will lead to behavioral changes relatively rapidly.

The next step is to teach the parents the behavioral principles behind the interventions they will be using. It is helpful to provide them descriptions of similar cases which have been previously treated with success and relevant articles dealing with the interventions which they will be carrying out. The consultant will often model for the parents a specific therapeutic intervention which he expects them to perform, and the parents should be given an opportunity to practice interventions in the presence of the consultant who can then provide social reinforcement for appropriate behaviors. A wireless transceiver system is a useful device for providing feedback to parents without the child being able to hear. As soon as the parents exhibit an appropriate behavior, the therapist can praise them. After the first practice session, the consultant should review the principles and therapeutic practices with the parents and answer their questions.

Before the parents initiate therapeu-

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tic interventions, they should collect data on the target behaviors which they wish to change in their children. Once the consultant feels that sufficient baseline data have been gathered, the parents may introduce their first therapeutic intervention. They should continue to record the target behavior or behaviors, and they should not work on more than two behaviors at a time. Once they have obtained improvements in a target behavior, they should return to baseline conditions where it will usually be possible to see if the therapeutic intervention has been responsible for the desired change. This procedure also increases the understanding and confidence of the parents in the fact that they have control over their child's behavior. After a few days, the parents are instructed to reinstitute the therapeutic interventions, and to continue until the desired levels of the target behaviors are reached. Then the consultant helps the parents arrange for the home environment to permanently maintain the newly acquired behaviors. During the course of active consultation with the family, it is helpful for the therapist to make observations of parents and child in the home. When the consultation sessions are terminated, a formal followup evaluation date is agreed upon.

Illustrative Case

Sleepwalking—Bobby was almost 8 years old. Sleepwalking occurred 6 weeks before my first interview with his mother. Prior to that, Bobby walked in his sleep four times a week.

His development was normal, and he showed no signs of neurological deficit. The clinical data indicated an anxious guilt-ridden boy who avoided performing assertive and aggressive behaviors and exhibited a preoccupation with religious matters.

I saw Bobby and his mother in the playroom for the first 25 minutes and his mother alone for the last 25 minutes of each of our sessions. For the conjoint sessions I instructed his mother to put his feelings into words for him, to let him decide what kind of playing he was to do, and to praise and approve aggressive play.

In our third session, I discovered that there was a specific temporal sequence to Bobby's sleepwalking episodes which ran approximately as follows: he started having a nightmare about a "big black bug" which was chasing him; he began to sweat heavily; he moaned, talked in his sleep and tossed in his bed; and he got out of bed and walked through the house in his sleep.

The nightmare had become the conditioned stimulus which triggered the response of sleepwalking. I explained this to his mother and told her that our task would be to elicit a response incompatible with sleepwalking. I instructed her to awaken Bobby completely each time he began walking in his sleep or showing signs of an impending episode. She was to take him into the bathroom and wash his face and the back of his neck with cold water until he was fully awake. Next, she was to return Bobby to his bed where he was to hit and tear up a picture of the "big black bug." Bobby made several drawings of the bug and kept them beside his bed.

Five weeks after the awakening procedures were introduced he had his first week free of sleepwalking. During followup, Bobby reported that he woke himself up whenever he dreamed about the "big black bug." Mrs. B. said that she had questioned him on the morning following each episode. On the last three occurrences he denied that he had dreamed of the bug. Mrs. B. indicated that she had

given him a spanking on each of these 3 days; on each of the nights following the spankings he walked in his sleep.

Mothers' Groups

Since the fall of 1969 we have been training mothers of preschoolers to treat the behavior problems of their own children. Each series consists of ten 2-hour sessions with 5 to 12 members. We train the mothers in how to carry out a functional analysis of behavior, and each mother is required to select one behavior which she wants to change in her child. She keeps systematic records which she brings with her each week to the group session. The mothers share their experience with each other and are supervised by the instructor. If more serious or more complex problems arise, the mothers are referred for individual consultation. Referrals come to this program primarily from nursery schools and pediatricians.

Mothers and Peers as Group Therapists

For 5 years I have been conducting research on how best to treat shy withdrawn boys in groups. New groups are being developed in which the mothers and the children themselves are taught to be the group therapists.

Peer as therapist—There is some evidence that the best way to treat or to teach a person is to get him to treat or teach someone else. Applying this concept to our own treatment program, the children take turns being therapist of their own group. The present plan is to have one child be the therapist for the other three in a given week. The "therapist" wears a wireless receiver and receives instructions and social reinforcement from one of the research assistants observing from behind a one-way mirror.

Capitalizing on children's natural tendency to enjoy games, the "therapist" will wear a headband which says across the front, "Chief," and a feather to indicate his status for the particular treatment session. Each child will have a turn at being "Chief" with a different boy being Chief for each session, giving us 4-week cycles. We will have the children draw lots before the first treatment session to establish the order they will go through, and we will retain this order throughout the treatment program. In the groups planned for the next 4 years the peer therapist condition will always be paired with token reinforcement—that is, the "Chief" will always give out tokens to the other children.

Mother as therapist—In the same way that there may be real advantages to having children take turns treating each other, there may be real advantages in having mothers treat their own sons and daughters. Mothers opposed to active, assertive behaviors in their sons and daughters may experience gradual reduction in anxiety when confronted with four children the age of their own child who are engaging in the same kinds of behaviors. Since the mother will be instructed to reinforce prosocial behaviors, she will be engaging in the kinds of behaviors we hope she will be carrying out at home. Firsthand experience in the clinic should increase the probability of her engaging in these behaviors at home with her own child.

As with the peer therapist, the mother therapist will wear the receiver and receive direction and reinforcement from one of the research assistants who is observing from behind the one-way mirror. The mothers will draw lots, as did the peer therapists, so that each week of the 4-week cycles there will be a different mother therapist. The mothers will only treat groups in which their child is present.

Effects of Audiences Upon Learning and Retention

JOHN P. HOUSTON

In attempting to explain the effects of passive audiences upon learning and performance, it has been proposed that the mere presence of others will raise the general drive level of an individual. This increased drive level will enhance the evocation of dominant responses, where dominant responses are defined as those most likely to occur. If incorrect responses are dominant, then a passive audience will produce a decrement in performance. If correct responses are dominant, nearing completion, then an audience will facilitate performance. This analysis appears to provide an explanation for data, some of which suggested facilitation and some inhibition due to the presence of an audience.

Experiment I

Experiment I was suggested by two considerations. While it seems plausible to assume that audiences raise drive level, these audiences could have alternative effects which might account for some of the data, particularly those displaying impaired performance. For instance, the presence of others during a learning task might merely distract the individual. Performance decrements could be attributable in part to reduce attention rather than to increase in drive level. Also most experimentation has been concerned with tasks which are conditions under which the retention of a given task, which has been learned alone, can be affected by the introduction of an audience during interpolated learning.

In this retroactive inhibition (RI) experiment, the subjects learned one or two successive paired-associate lists. The first list was learned alone, while the second list was learned either alone or in the presence of an audience. All subjects were then tested for recall of the first list. The two lists conformed to the A–B, A–C paradigm. One question this study asks is whether the presence of an audience during second-list learning will affect unlearning of the first-list associations.

Contrasting predictions concerning second-list learning and first-list recall may be made on the basis of the drive and distraction interpretations of the effects of audiences. When the subject learns the A–C list in this situation, the A–B associations probably compete with the formation of A–C associations. It seems likely that the B responses are not dominant in the sense that they are most likely to occur during the course of learning. The assumption is that B responses will occur during A–C learning but that the C responses will more likely occur. Theory and data suggest that unlearning of the A–B associations, which transpires during A–C learning, may occur in a manner similar to that of experimental extinction.

The drive interpretation yields that if during second-list learning the A–C associations are most likely to occur, and that the A–B associations compete with the A–C associations but are not dominant, then the presence of an audience during A–C learning should facilitate A–C learning. As far as amount of RI or unlearning is concerned, an audience during A–C learning should reduce unlearning of the A–B associations by reducing the number of times the B responses occur

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as errors during A–C learning.

The distraction interpretation suggests that because audiences reduce the amount of attention given to the task at hand, second-list learning should be poorer with an audience than without one. A clear prediction concerning unlearning of the A–B associations cannot be made on this basis, because it is not known how a second-list audience will affect a subject's tendency to give first-list responses as errors during second-list learning. One might expect more of these errors and therefore more unlearning of the A–B associations.

The 72 subjects were male psychology students. The three conditions of the experiment (Audience, Alone, Control) were unsystematically arranged so that each occurred once in each of 24 successive blocks of three. The stimuli consisted of eight nonsense syllables, while the responses were two sets of eight adjectives. Intralist and interlist response similarity and intralist stimulus similarity were as low as possible. Two different pairings of the stimulus and response materials were developed and each was used as frequently as the other. Within each condition, a given list was used as the first list half of the time and as the second list half of the time.

All learning was conducted at a 2:2-second presentation rate on a memory drum. All subjects first learned the A–B list for 12 anticipation trials. Following A–B learning, the Alone group learned the A–C list for 12 anticipation trials. Following A–B learning in the Audience condition, the examiner called in two female student accomplices, who did not speak to the subject, to watch him learn the next list. The Audience group also learned the second list for 12 anticipation trials. Control subjects learned the A–B list for 12 trials and then worked on a pyramid puzzle for a time equivalent to that required by the experimental groups to learn the second list. Following the interpolated task, the accomplices left the room. All three groups of subjects were presented recall sheets with the stimuli in a new random order. The subjects were allowed as much time as they wished to recall and record the correct first-list responses.

The mean numbers of correct first-list responses produced by the Alone, Audience, and Control conditions were 48.75, 55.83, and 52.50, respectively. These means did not differ significantly, indicating that the three groups were equal in learning ability. The mean numbers of correct second-list responses given by the Alone and Audience groups were 50.20 and 62.41, respectively. Because of the apparent correlation between first- and second-list learning scores in the Audience and Alone conditions, List 2-List 1 differences were analyzed in this situation. The Alone group displayed a mean increase of 1.45 correct responses from List 1 to List 2, while the Audience group yielded a mean increase of 6.58 correct responses. These results fail to support the distraction interpretation. Although the difference between the means was in the direction predicted, statistical differene was not quite significant.

The mean numbers of first-list responses recalled correctly by the Audience, Alone, and Control groups were 4.92, 3.08, and 6.83, respectively. Loss scores were analyzed, and the difference between the last trial of first-list learning and recall was tabulated for each subject. The Control condition yielded a mean increase of .55 correct items, while the Audience and Alone conditions displayed mean losses of .70 and 2.12 items, respectively. The overall effect was significant. More impor-

tant, the difference between the Audience and Alone conditions was significant. This result agrees with the analysis which predicted that the Audience condition would yield less RI than the Alone condition.

There is an alternative interpretation of the present results. It is possible the effects were due to the fact that audiences have functional cue properties. That is, the audience may comprise part of the total set of stimuli used by the subject. To the extent that an audience can serve as an effective stimulus, the A–B, A–C paradigm will, when an audience is introduced during second-list learning, become more like the A–B, C–D paradigm. The first- and second-list stimuli will be less similar in the Audience than in the Alone condition. As the A–B, C–D paradigm produces less negative transfer and less RI than the A–B, A–C paradigm, the results could have been determined by the reduced interlist stimulus similarity in the Audience condition.

Experiment II

Experiment II was designed to determine if audiences do possess functional cue properties. The subjects first learned the competitional paired-associate list. Learning was accomplished either alone or in the presence of a passive audience of two. One day later, the subjects were tested for recall of the list either alone or in the presence of the same audience.

The 80 male subjects were obtained from the same pool used in Experiment I. The conditions were unsystematically arrange in 20 blocks of four such that each condition occurred once in each block. All subjects first learned the 10-item competitional list to a criterion of one perfect trial plus three trials. Learning was accomplished on a memory drum at a 2:2-second presentation rate. Two female accomplices were introduced into the Audience conditions as in Experiment I. The subjects were dismissed and told to return the following day. At that time, the same two accomplices were introduced into the appropriate conditions. All subjects were given a paced recall test in which each of the stimuli were exposed for 2 seconds. The stimuli were in the order that the subject would have received had he had one more learning trial on the previous day. Responses were not exposed during the recall test.

The mean numbers of trials to criterion required by the Audience-Audience, Audience-Alone, Alone-Audience, and Alone-Alone conditions were 16.90, 16.20, 18.20, and 16.25, respectively. The mean numbers of responses recalled correctly by these same subjects were 4.50, 6.75, 6.90, and 7.00, respectively. The recall results do not support the notion that audiences may serve as functional cues. When considered separately, neither of the unchanged conditions appears to have produced significantly better recall than the changed conditions. The recall main effect, the learning main effect, and the interaction all were significant. Apparently, the presence of an audience during both the learning and the recall of a list produced a large effect, while the presence of an audience during one stage but not the other yielded little effect.

Although both experiments involved competitional situations, Experiment I yielded a facilitative effect, while Experiment II involved an inhibitory audience effect. It seems reasonable to assume that incorrect responses were more dominant in Experiment II than in Experiment I, and inhibitory effect would more likely occur in Experiment II than in Experiment I.

Contingent Negative Variation and Individual Differences: A New Approach in Brain Research

JOSEPH J. TECCE

The study of electroencephalography began in 1876 with Caton's report of spontaneous and evoked changes in electrical activity in animal cortex. Later Berger discovered that these electrical fluctuations, which he called the "electrenkephalogramm" or electroencephalogram (EEG), could be recorded from the human scalp. This finding launched the study of EEG in man. Progress in the understanding of the EEG and higher mental functions has been slow. Except for work on organic disorders and altered levels of consciousness, there are relatively few reliable relationships between the human EEG and cognitive processes.

In experiments designed to demonstrate reliable changes in evoked potentials by conditioning techniques, Grey Walter and his associates discovered in EEG recordings an "evoked" slow, surface-negative electrical potential called "contingent negative variation" or CNV. This discovery has inspired considerable research effort to relate CNV to psychological processes in man. The finding that CNV is related to individual differences in attention and arousal would suggest a usefulness of CNV in psychiatric research, since these two processes are considered to be impaired for some psychopathologic groups.

Basic Characteristics of CNV

CNV derives its name from being a slow, surface-negative shift in the EEG baseline that typically depends on the association (contingency) of two successive stimuli. The experimental paradigm for generating CNV is like that of a constant-foreperiod reaction time (RT) experiment. A first stimulus (S_1) is followed within an invariant time interval by a second stimulus (S_2) to which the subject is required to make a motor response. CNV is usually recorded with a scalp lead at vertex for placement of EEG electrodes with one or both mastoid processes as reference.

CNV is not readily seen in the raw EEG trace of most normal adults. Therefore, the technique of "averaging" is used to enhance CNV amplitude relative to background EEG. Averaged CNVs are clear in about 90 percent of normal adults; but this percentage is lower for selected populations, e.g., medical students.

Development—The experimental format for development of CNV consists of S_1, S_2 and a motor response. CNV builds up over five to a "few dozen" trials. Conventional stimuli are light flashes, clicks, and tones. Verbal signals have generated a CNV large enough to be seen in the single trace, e.g., "ready" for S_1 and "now" for S_2. Although CNV can occur without a response to S_2, development is facilitated by a physical or mental response to S_2. Merely judging the time of occurrence of S_2 or thinking in response to S_2 can lead to a clear, though unstable CNV. CNV is larger when a motor response occurs to S_2. Computer averaging of several CNVs is usually necessary to obtain a clear CNV.

Morphology-Ascending Limb—CNV typically rises about 0.2 seconds after the evoked potential to S_1. Two

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types have been differentiated: type A, having a fast rise time to a peak negative voltage that persists until response to S_2; type B, having a gradual rise time to a negative voltage that peaks approximately at the time S_2 occurs. Three types of CNV shape have also been differentiated: saw tooth (most frequent), having a gradual rise from baseline; square wave, having a sharp ascending limb and steady negativity; and convex dome.

Magnitude—CNV magnitude has been defined in three ways. One is to measure the maximum negative voltage of CNV occurring within the S_1 to S_2 interval compared to the isoelectric direct current baseline that occurs before S_1. A second technique is to measure area under the CNV trace. A third method involves the measurement of the mean negative excursion for a defined epoch within the S_1 to S_2 interval relative to an EEG epoch prior to S_1.

Descending limb—With response to S_2 there is an abrupt termination of the negativity of CNV. This positive-going limb, called the "resolution" of CNV, can be slow and inconsistent as well as immediate. Delaying the motor response to S_2 for over 2 seconds prolongs CNV in its negative phase. The terminating limb of CNV can overshoot baseline and become positive in polarity. The positive-aftereffect is clearest when S_2 is varied from trial to trial and when S_2 is a visual stimulus which subjects attend to carefully for detail. A heightened negative component called a "diversity wave" appeared superimposed on CNV immediately following S_2 when it was varied from trial to trial.

Topography—For normal subjects, CNV is bilaterally symmetrical in amplitude and morphology over the two hemispheres of the brain. It appears that CNV amplitude is highest at vertex, smaller in frontal areas, and smallest in posterior regions of the brain.

Scalp and direct placements—The preponderance of CNV work has been done with scalp placements. Recordings have also been made from subcutaneous, epidural, and cortical sites. The morphology of CNV recorded on the scalp was similar to that recorded with subcutaneous electrodes and with epidural placements, and scalp CNV showed changes similar to CNV recorded from implanted electrodes in the orbital frontal cortex of patients.

CNV in Normal Adults

For formal adults, CNV shows interindividual variability. Some investigators believe these differences constitute experimental error and are undesirable sources of variance; but for others these individual differences constitute important information to be studied in relation to psychological processes.

CNV and interindividual variability—The evidence for between-subjects variability is as follows. The simple measurement of CNV in the raw EEG trace was possible for only 20 percent of normal adults and averaged CNV was recorded for 80 percent to 90 percent of normal adults. The range of CNV amplitude found among normal individuals was 10μv-50μv. In one study, where the number of S_1 to S_2 trials was controlled, CNV amplitudes of 25μv-30μv were recorded for some individuals while others showed amplitudes of only 8μv to 10μv. Although CNV amplitude was larger in the frontal than in the posterior regions for most individuals, some subjects showed the reverse effect. With some individuals onset of CNV was earlier in the frontal regions than in the vertex, while in other subjects CNV onset appeared synchronous in

these areas. When S_2 was omitted for half the "S_1-S_2-response" trials, a decrease in CNV amplitude occurred. This "equivocation" effect varied considerably; most subjects showed the expected CNV reduction while other subjects showed no change and even a slight increase in amplitude. When S_2 was omitted without warning, CNV amplitude usually declined to zero, but this "extinction" effect varied greatly among individuals.

Individual difference variables and CNV—There is evidence that between-subjects variability in CNV development is related to individual differences in psychological factors. For example, one group of young subjects called "scholar gypsies" showed rapid CNV development and unusual maintenance of CNV when S_2 was sometimes omitted. "Highly suggestible and easily hypnotized" individuals did not show the usual reduction in overall CNV amplitude; instead the negativity of CNV appeared to be delayed in its return to baseline. This finding has been interpreted as showing that suggestible subjects retain a high level of expectancy of S_2 despite its nonoccurrence.

An important aspect of individual differences in CNV amplitude is the idiosyncratic sets, attitudes, and strategies developed by subjects during the experiment. These personalized responses are partly a function of background interests and experiences. For instance, two subjects trained in Morse Code showed exaggerated reduction in CNV amplitude when they tried to decipher extraneous tones presented between S_1 to S_2 pairs. The tones presumably distracted them more than other subjects. Similarly, CNV was suppressed in one individual who was embarrassed and felt foolish in being required to say "seven" repetitively between S_1 to S_2 presentations. This embarrassment was a possible source of heightened arousal levels and of covert verbalizations which served as distraction from the task of responding to S_2. It is also possible that the mere act of vocalization served to reduce CNV. When young subjects interpreted the CNV experiment as an intelligence test, erratic CNV responses resulted. Elevated CNV amplitude was found in a shock-threat situation where subjects reported paying greater attention to S_2 as a way of avoiding thoughts about the shock. This work suggests that idiosyncratic interpretations and reactions to the experimental tasks can influence CNV magnitude and that one such experimental strategy involves attending to S2.

There has been some attempt to relate individual differences in CNV amplitude to psychometric measures. In one study, significant (negative) correlations were reported between CNV amplitude measured during distraction and questionnaire scores which presumably measured anxiety, obsessionalism, and depression. In another study, no relationship was found between CNV morphology and psychopathology, particularly obsessional anxiety, as defined by psychometric tests. Where low shock and high shock were used as S_2, high-anxiety subjects had lower CNV amplitude when high shock was anticipated for S_2; there was no difference between the groups in the low-shock situation. This was interpreted as due to the high-anxiety group having a "higher baseline cortical negativity" than the low-anxiety group, and that during high shock a ceiling was reached more quickly by the high-anxiety group.

In summary, there are suggestions that individual differences in CNV development are related to psychological factors. Low CNV amplitude

seems related to impairment in attention functions (distraction) and to high levels of arousal.

CNV and Psychopathology

Neurotic patients—CNV has been recorded from chronic-anxiety neurotics, phobic patients, obsessive-compulsive individuals, and hysterical patients. In chronic-anxiety neurotics, CNV was difficult to establish, developing very slowly and inconsistently, or not at all. In contrast to normals, in whom omission of S_2 led to gradual extinction of CNV and restoration in five or six trials, CNV in anxiety neurotics was suppressed after two or three omissions of S_2 and sometimes took hundreds of trials to return. In a study of chronic neurotics characterized by high anxiety, CNV was lower in amplitude compared to that of control subjects. These patients showed greater CNV reduction than normal controls during distraction by irrelevant tones presented between S_1-S_2 pairs. This type of distraction has been reported earlier to have minimal effect of CNV in normals and to have abolished CNV in anxious patients. The reduced CNV in chronic-anxiety neurotics may be due, in part, to distraction resulting from covert verbalizations associated with worry and fear. The lowered CNV amplitude may also be related to heightened levels of physiological activation associated with persistent fear and apprehension.

Phobic patients have shown reduced CNV amplitude and complete abolition of CNV after a few omissions of S_2. In a phobic patient who had shown no CNV, long reaction times to S_2, and a high heartrate, after therapy by "multifocal selective frontal leucotomy" there resulted clear CNV, quick responses to S_2, and a lowered heartrate. In a patient with hysterical anesthesia below the waist, increased CNV amplitude and increased response speed to S_2, accompanied restoration of feeling in the legs. The inadequate development of CNV associated with phobia may be related to impaired attention to the experimental task resulting from covert verbalizations associated with worry and fear.

Obsessional states involving high levels of distraction would be expected to relate to low CNV amplitude. Yet CNV amplitude was found slightly *higher* in chronic obsessional neurotics who were relatively anxiety-free. CNV recorded by radiotelemetry in an obsessional neurotic showed a marked reduction while the patient sat alone in a room, and this situation was known to provoke obsessional thoughts in the patient. CNV may have been reduced by distraction from recurring thoughts of a "sense of isolation combined with remote surveillance." In contrast to normal controls, for obsessive-compulsive patients CNV persisted after many trials of omission of S_2. A primary feature of CNV was the failure of the wave to decline abruptly to baseline upon response to S_2. Finally, obsessive-compulsive patients showed *decreased* CNV amplitude in the response situation. Since this CNV reduction was accompanied by a concomitant elevation in the evoked potential to S_2, the interpretation was made that these patients paid too much attention to S_2 and not enough to the preparatory value of S_1.

Psychotic patients—The study of CNV development has been confined to schizophrenics and schizoid individuals. Compared to normal controls, schizophrenics showed smaller CNV amplitude and greater CNV reduction caused by distracting tones given between S_1-S_2 trials. CNV was infrequently seen in disturbed or autistic children. Schizoid individual

although showing highly variable CNV development, produced normal-sized CNVs.

Character disorders—Individuals described as recidivist delinquents with psychopathic personalities have shown only meager evidence of CNVs.

In summary, CNV was reduced in neurotic and psychotic patients and in patients with character disorders. Some of this work suggests that lowered CNV amplitude is related to impaired attention and elevated levels of physiological arousal. Further study of CNV and psychopathology is needed with control of artifacts from eye movement potentials.

CNV appears to increase in amplitude with age up to the late teens, and the anteroposterior difference in CNV assumes an adult appearance about the time of puberty. The role of attention and distraction appears important in the development of CNV in children. Further work is needed with larger groups of subjects and with control of body movements and eye movement potentials, which have been reported to be a serious problem in recording CNV from children.

CNV and Pathophysiology

There has been some preliminary study of CNV in selected pathophysiological groups, such as dyslexic children, visually deficient children, epileptic patients, and patients with known brain damage. In dyslexic children, CNV appeared normal when S_1 and S_2 were light and sound, respectively, but diminished or disappeared when S_2 was a visually presented trigram or a visually presented word. However, in this study, the CNV deficit was specific to a 6-year-old dyslexic child; in an 8-year-old dyslexic subject, CNV appeared when S_2 was a trigram. With S_2 as a visual stimulus, dyslexic children showed a pronounced, long-lasting positive deflection after CNV returned to baseline. This was interpreted as reflecting rejection of the visual stimulus by the dyslexic children. The "positive-after-effect" was reported larger when S_2 was a visually presented word than when S_2 was a picture.

In a study of normal and partially sighted children 11 to 18 years of age, stimuli for CNV development were presented in visual, auditory, and tactile modalities. CNV was developed in each modality for the normal children and for one subgroup of the visually deficient children. CNV was absent or inconsistent in a second subgroup of the partially sighted children, particularly for visual stimuli.

Attempts have been made to study CNV during epileptiform discharges. In one patient, it was possible to record CNV during brief spike and wave activity induced by photic stimulation; responses to S_2 were not impaired. In a study of 12 centrencephalic epileptics, spontaneous generalized paroxysmal discharges impeded clear evaluation of changes in CNV. The impairment of operant responding during these seizures was interpreted as evidence of possible CNV disruption. Three patients with focal epileptic discharges of the temporal lobe showed occasional "transitory suppression or considerable disorganization of CNV;" the effect was clearest in the hemisphere not showing the epileptiform activity.

CNV comparisons have been made between normal subjects and 20 patients with brain lesions. Reduced CNV amplitude was found in the patient group, particularly on the side of the head nearer the lesion, and the result was the appearance of "asymmetries in the form and amplitude of the CNV in the majority of cases." The CNV reduction was especially

pronounced in the patients with parkinsonism.

Methodological Issues

CNV is a reliable measure of psychological processes in man. This reliability is, in part, a function of the similarity in methodologies employed by CNV investigators. Yet there are several problems which are cogent to the study of individual difference factors and CNV.

Subject populations—The manipulation of CNV magnitude has been demonstrated for three sophisticated author-experimenter subjects, who increased and decreased CNV amplitude by procedures involving increased and decreased attention to S_2. These authors suggested that individuals familiar with CNV not be used as subjects in CNV experiments. However, "CNV-naive" subjects also bring self-instructed sets to the CNV experiments. Postexperiment interviews should be conducted to determine possible idiosyncratic mental attitudes of subjects affecting CNV development during the experiment. Since ocular potentials can be a serious source of distortion, subjects might be selected and/or trained for minimization of eye movements during the experiment.

Procedures—Two procedures relevant to CNV work in children and psychiatric populations involve use of meaningful stimulus materials and radiotelemetry. It is likely that one source of difficulty in recording CNV in children and in psychiatric patients is the failure of conventional stimuli to "turn on" these individuals. The two possible advantages in the use of more interesting, personally meaningful stimuli are the likely increase in CNV amplitude resulting from greater personal involvement in the experimental task and the likely reduction in ocular potential artifacts resulting from random eye movements.

A major technological advance in CNV research has involved radiotelemetry. This work suggests the possible value of radiotelemetry in children, psychiatric patients, and normal adults who might be particularly concerned about the restraints imposed by conventional EEG-recording situations.

Experimental design—One advantage of CNV as a neuropsychological phenomenon is the small number of trials typically needed to obtain an averaged CNV that is measurable. However, a testing session can last for an hour or more and CNV changes can result from fatigue, boredom, and other time-related processes. Two dangers inherent in such designs involving repeated measurements on the same subjects are a possible confounding of time-related effects with effects from the experimental variables and carryover effects from one experimental condition to another.

One way to deal with the problem of time-related effects is to counterbalance within a testing session the experimental conditions. For example, two groups of subjects can be given the experimental or treatment conditions (T_1 and T_2) in counterbalanced order. This procedure represents an attempt to "buffer" carryover effects of the first treatment condition to the second treatment condition. An important consideration is the establishment of a stable CNV prior to introduction of the treatment conditions. The designs appear well suited for CNV work with children and psychiatric patients, who often show considerable interindividual variability in physiological measures and who are likely to require substantial recovery time between treatment conditions.

CNV and Other Electrophysiological Functions

The explanation of CNV as a neuropsychological phenomenon hinges partly on its relationship to other electrophysiological measures, such as autonomic functions, motor activity, and eye movements.

Autonomic functions—The development of CNV is related to autonomic activity, varyingly measured. Early work suggested an inverse relationship between CNV development and autonomic activity, i.e., as CNV developed into a stable response there was a decrease in general autonomic excitement. In contrast, with anxiety patients and some normal children the generalized autonomic imbalance persisted as CNV became stabilized. The inverse CNV-autonomic relationship was also missing in young psychopaths, who showed little or no CNV and little autonomic excitement during the occurrence of S_1-S_2 motor response trials. This relationship also holds true for anxious patients, who showed reduced autonomic activity and no change in CNV after the administration of tranquilizing drugs. In summary, CNV development and generalized autonomic activity are inversely related in normal subjects, but not in anxiety neurotics, psychopaths, and children.

The study of palmar galvanic skin response as a source of artifact in CNV measurement has resulted in negative findings. Averaged CNV and GSR have dissimilar time courses and shapes. CNV has occurred in trials where GSR is absent and can be recorded from skinless surfaces like the dura and cortex. These findings indicate that CNV is not due to palmar GSR activity. The relationship between CNV and scalp GSR has not yet been studied.

There are findings that suggest an inverse relationship between CNV amplitude and heart rate level. CNV was reduced and heart rate was elevated during either phasic distraction or sustained distraction. Chronic-anxiety neurotics had lower CNV amplitudes and higher heartrate levels than did normal individuals. In a study of phasic changes in heartrate, larger CNV amplitudes accompanied greater heartrate deceleration occurring within the S_1-S_2 interval as an anticipatory response to S_2. In a similar investigation, higher CNV amplitudes were related to both heartrate deceleration and acceleration. Because of a different latency and time course, electrocardiographic activity does not appear to be an artifactual source of CNV development.

CNV has been studied in relation to two autonomic-related functions, namely, electromyographic activity and the respiration cycle. There is some evidence that CNV is enhanced during the inspiratory phase of respiration and reduced during the expiratory phase. This finding that respiratory phase relates to CNV magnitude deserves study.

Motor activity—A slowly increasing surface-negative cortical potential of 10–15 V can be measured on the human scalp within the 1-second interval before the occurrence of voluntary motor movements of the hand or foot. This has been called "readiness potential" (RP). The RP is similar to a type B CNV, which has a slowly ascending limb. Like CNV, the magnitude of RP is maximum at the vertex, and appears bilaterally distributed over the hemispheres. Unlike CNV, the RP can be larger over the side of the head contralateral to the responding limb and requires a motor response to occur ("intending" to give a motor response). Another cerebral potential related to voluntary motor

movements is the "motor potential." The motor potential consists of four successively occurring components: (1) a slow negative wave which occurs before motor movement and which is shaped like CNV and the RP; (2) a small positive wave occurring before motor movement, (3) a large negative wave occurring during motor movement; (4) a large positive wave occurring after motor movement. The slow negative wave seems to be the RP.

Eye movement potentials—There is evidence that scalp-recorded CNV can be altered by potentials resulting from eye movements. Voluntary downward eye movements can produce large negative shifts in the EEG baseline as recorded from vertex. When these were synchronized with S_1 (downward) and S_2 (upward), CNV amplitude was doubled. Upward eye movements lead to positive baseline shifts. The effects of ocular potentials on recording of CNV scalp follow an anteroposterior gradient, being greatest in frontal leads but being present even at the occiput. Laterally, these ocular effects are stronger at vertex than at a temporal site.

The successful control of CNV contamination by eye movement artifacts is not simple and the extent of success varies among individuals. The simplest method is to require visual fixation during the S_1-S_2 interval when CNV occurs. For individuals who have considerable eye movements (children and some psychiatric patients) eye fixation is difficult. Another method involves the on-line use of a potentiometer, which allows the cancellation of ocular potentials by adjusting the resistance between an anterior scalp site (where ocular effects are largest) and vertex (where CNV is usually recorded). A third technique involves the mathematical adjustment of CNV amplitude based on the correlation between magnitude of eye movements and magnitude of pseudo-CNV recorded at vertex. A fourth method consists of excluding from analysis CNV trials where eye movement artifacts occur. If eye movement potentials are comparable over experimental conditions, interpretations in terms of experimental variables independent of ocular effects is possible. The recording of eye movements is essential in CNV experiments.

A Proposed Theoretical Model

CNV is an electrocerebral event that shows variation among individuals. Two factors associated with these differences are attention and arousal. The view that impaired attention is related to inadequate CNV development is partly based on the finding of reduced CNV amplitudes among chronic-anxiety neurotics, phobic patients, schizophrenics, normal children, and highly anxious normal adults (during psychological stress). A characteristic common to these groups is a susceptibility to distraction during the experiment. Attention is considered a hypothetical process involving steering (selective) functions that facilitate response to relevant stimuli from the environment to the exclusion of irrelevant stimuli. Any interference is expected to reduce CNV amplitude, such as occurs when distracting stimuli interfere with attending to S_2.

A second process is arousal. The view that high levels of arousal are related to inadequate CNV development stems from the finding of reduced CNV amplitudes among some of the patient groups who have been characterized as "overaroused." The reduction in CNV amplitude associated with elevated levels of heart rate is additional evidence for a high

arousal-low CNV amplitude relationship. A generalized autonomic imbalance accompanied early stages of CNV development where CNV was not a stable response. In addition, there is some indication that a drop in CNV amplitude accompanies low levels of arousal. The findings that increased levels of arousal are related to elevated CNV amplitude and that high and low levels of arousal are associated with reduced CNV amplitude suggest a nonmonotonic relationship between arousal and CNV amplitude. Arousal is considered a hypothetical process that energizes behavior unselectively, affects only intensity of response, and does not involve the directional, associative functions of attention. This distinction between attention and arousal on the basis of cue utilization and energy mobilization, respectively, stems from theoretical contributions of both activation and motivation theorists.

Studies of individual differences in CNV suggest a two-process theoretical model to account for CNV findings. CNV amplitude appears to be positively and monotonically related to attention processes and nonmonotonically related to arousal processes. A logical corollary is that attention improves with increased arousal up to an optimum level and becomes impaired with further physiological activation. One effect of excessive physiological arousal may be distraction stemming from internal stimulation. Arousal and attention are conceptualized as separate, but related brain functions.

Application of CNV to Psychiatric Research

The view that CNV changes are related to attention and arousal processes suggests the use of CNV as a neurophysiological tool to study patient populations such as schizophrenics, who have been characterized as having deviant arousal levels and impaired attention functions. Of the sources of pseudo-CNV waves eye movements are the most insidious. Because of uncontrollable eye movements in disturbed psychiatric patients, the profitable use of CNV in psychiatric research has been questioned. There is a need for further evaluation of ways to control eye movement potentials and for additional empirical work on the study of CNV in clinical groups. Finally, it has been cautioned that the establishment of clinical or diagnostic usefulness of CNV hinges on an understanding of the physiology of this slow brain potential.

Heterogeneity of CNV

One of the most reliable findings is the elevation of CNV amplitude when a motor response is made to S_2 compared to a no-response situation. Since the readiness potential occurs prior to a voluntary motor response, there is a question as to what extent CNV is reflecting the readiness potential in the situation where a motor response is given. There has been a shift from a view that CNV is a purely psychological phenomenon to a consideration of motor processes as a prime determinant. Conversely, in explanations of the readiness potential, motor processes have been deemphasized in favor of psychological processes. Clearly, there is a need for further work.

Neurophysiological Genesis of CNV

CNV has been interpreted mainly as a cortical phenomenon. However, based on evidence from the study of slow potentials in animals, it is important to include subcortical mechanisms. For example, electrical stimulation of the midbrain reticular forma-

tion resulted in slow negative potentials on the cortex. Spontaneous surface-negative potentials appeared on the cortex of rats during behavioral arousal occurring during transition from sleep to wakefulness. It would be of interest to know what CNV changes result from administration of centrally acting drugs of known influence on the reticular formation, e.g., amphetamines and chlorpromazine. The implication of the reticular formation (important for the functions of wakefulness and alertness) in the genesis of CNV is consistent with the two-process (attention and arousal) theoretical model proposed here to account for CNV changes. It was concluded recently in a review of work on frontal lobe damage in man that the frontal areas of the brain are concerned with arousal processes. Consequently, in addition to previous neuropsychological theorizing that has emphasized subcortical regions of the brain as mediating attention and arousal functions, the cortex, e.g., frontal regions, deserves consideration.

Effects of Hypnotic Susceptibility and Training on Responses to Stress

PERRY LONDON and RONALD A. MCDEVITT

This experiment originated in connection with a problem which is elementary and pervasive in the human struggle for control of the environment—how to maintain control over oneself in the face of emergencies. At the most elementary level, under the most primitive conditions, this usually refers to self-control over performance in the face of physical distress like pain or hunger, thirst, cold, or heat. Technically, such problems are said to be those of *stress* and stress *resistance* or *tolerance*.

The problems of stress resistance can appear under ideal technological conditions in which bodily needs are well cared for. Equipment malfunctions, human errors, or "acts of God" may create emergencies in which elementary dangers must be confronted by use of elementary skills.

The investigation of stress presents problems of definition and operations. In physiology and psychology, the term stress varies in one or another context to refer to environmental stimuli, physiological mechanisms, performance variables, and subjective feeling states. There are also wide divergencies in the characteristic foci of researches on stress, with definition following operation. A variety of stimulus conditions have been used to induce stress, including electric shock, suggestions to highly motivated subjects of failure or incompetence, and extreme thermal conditions. The different types of stressors can be subsumed in two operational categories: general debilitating stressors—stress conditions that are continuous over long periods of time and tend to influence most measurable parameters of behavior and function, for example, thermal stress or prolonged deprivation; interference stress conditions—characteristically short in duration and task specific in their effects, such as a mild electric shock delivered to one hand during a coordination task, or a loud noise that interfered at random with one's ability to listen to instructions.

There is also variability in the measures that have been used to study effects of stress. These may be summarized under two headings: physiological reactions such as heart rate and basal skin resistance and psychological reactions such as performance decrements on psychomotor coordination tasks, impairments in cognitive functions, and subjective distress.

The focus of most stress research has been on damaging effects. There have been few studies on stress resistance. Most stress resistance reports have been anecdotal studies of natural stress situations such as war, internment in concentration camps, and physiological trauma. Though these reports are valuable, they do not offer opportunities for precise examination of the effects of stressful environmental stimuli and resistance efforts on the interactions of physiological mechanisms and psychological variables.

Among environmental stressors, thermal stress offers a good medium for research, as does electric shock among interference stressors, and hypnosis provides a technique for training and examining the processes of stress resistance.

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Hypnosis and pain stress—Stress resistance may be studied by reference to the same criteria that have been used to study the debilitating effects of stress: physiological mechanisms, performance measures, and subjective experiences. A deeply hypnotized subject can undergo various painful procedures with very little objective indication of pain. Similar reports have been published on autohypnosis or "autogenic training."

Hypnosis and thermal stress—Painful stimulation typically is used as an interference stressor. Performance also is adversely affected by general stress such as extremes of temperature.

One problem in studying resistance to heat is that it is not obvious how the body is supposed to resist. Cold stress is another matter, because the body is a heat-producing factory, and, for limited increments of cold, its adaptive response is to produce more heat. From the point of view of performance deficit, both heat and cold stress might offer the same problems of resistance, but the advantage to physiological interests suggests that cold stress is a more useful method.

Hypnotic susceptibility and stress resistance—A final consideration was that most studies on hypnosis and stress resistance have failed to consider the interactions of hypnotic susceptibility and training method. They have been restricted largely to subjects who were high in hypnotic susceptibility. The study of hypnosis as a training method should take hypnotic susceptibility into account, and this idea was incorporated within the design of this experiment.

The intention of this investigation was to study the relative abilities of individuals differing in their susceptibility to hypnosis to use autohypnosis for minimizing the combined debilitating effects of general and interference stressors on their performance, physiological responses, and subjective experience of discomfort. We hypothesized that: autohypnotic training in stress resistance reduces performance deficit under stress, alters the level of physiological reaction to the stressors, and reduces subjective experiences of discomfort; autohypnotic training in stress resistance is more effective with subjects who are high in hypnotic susceptibility than with subjects of low susceptibility.

The experiment was performed on 64 healthy male students ranging from 18 to 28 years old, selected on the basis of their susceptibility to hypnosis from approximately 250 volunteers. Half were high in susceptibility and half were low.

The subjects received three hypnotic susceptibility screenings. On at least two of the three they had to score in either the upper or lower third of the scale to qualify for the experiment, and on none of the three could they score on the opposite end.

An environmental control chamber (cold box), cooled to a mean temperature of 35° F. provided the general debilitating stress condition. Each session lasted about 85 minutes, including both hookup and operation time. Painful electric shock was used as the interference stress. The shock level was established for each subject at the beginning of his first stress session.

Two dependent measures were taken: performance and physiological. A pursuit rotor task and a vigilance task provided the performance measures. The vigilance task required the subject to integrate both visual and auditory stimulus signals, paralleling an airplane pilot's task to some degree. The subjects memorized a 5-digit number on a movie screen, and compared it with another 5-digit number that appeared on the screen

3.5 seconds later. If any two digits in the number matched *and* if a buzzer sounded while the second number was being observed, the subject was to respond by pressing a key.

The following physiological measures were taken: Heartrate, basal skin resistance, shiver and related arm movements, and temperature. One point of "core" temperature was taken, in the armpit.

Half of the subjects in each susceptibility group were randomly assigned to experimental or control groups and then scheduled for a 1-hour training session on the pursuit rotor. The procedure during training was identical with that used on the pursuit rotor during the experiment. The subjects did not receive training on the vigilance task, which is not a learning task. There were three sessions in the environmental control chamber, two base-rate sessions (one stress and one nonstress) and one experimental stress session. The subjects were clothed only in undershorts and were barefoot and barechested.

Subjects in the experimental group received 6 hours of autogenic training between the second baserate session and the single experimental session. Control subjects received no special training during this period. Autogenic training was conducted by four expert hypnotists. The experimental stress session was identical to the first stress session except that the subjects in the training groups were allowed 5 minutes before entering the cold box to put themselves into a hypnotic trance. After the final session, each subject wrote a report of his subjective experiences in the two stress sessions.

Results

The first assumption was that the stress of cold and electric shock would impair performance and increase physiological reactivity. All the physiological measures except heartrate showed significant changes in the expected direction from the room temperature to the stress sessions. Though heartrate barely changed from the room temperature to the first stress session, shivering rate more than tripled, basal skin resistance dropped almost a third, "core" temperature dropped from 91.03° F. to 80.12° F., chest temperature from 87.88° F. to 73.94° F. back temperature from 89.33° F. to 73.01° F., foot temperature from 83.11° F. to 62.51° F., and hand temperature from 85.88° F. to 59.85° F.

Changes on the performance measures were all highly significant. On the vigilance task, errors increased from 26.07 to 38.55. On the rotary pursuit task, in which the subjects were performing much closer to asymptote to begin with, mean time on target dropped from 24.30 to 21.46 seconds, and for the continuous run, from 24.40 to 21.96 seconds.

The effects of stress were not always independent of the hypnotic susceptibility of the subjects. In no case were there significant Baserate Sessions × Training Group interactions alone. Thus differences which might later be seen between the experimental and control groups in the final stress session could not be attributed entirely to baserate differences in their reactions. Four physiological measures and one performance measure showed significant interactions between hypnotic susceptibility and baserate reactions. For the former, low susceptible subjects tended to have higher shivering rates than did high susceptibles in the room temperature session and reacted with generally more shivering in the first stress session. The stress reaction is more pronounced among lows in the control group than among experimental group low susceptibles, and only

the triple interaction (Susceptibility × Training Group × Stress) approached significance. There were more pronounced Susceptibility × Stress Reactions interactions for back, foot, and hand temperatures among the physiological measures, and for the trial-block scores on rotary pursuit among the performance measures. For both back and foot temperatures, highs and lows had about the same means during the room temperature, session, but highs and lows had about the same means during the room temperature session, but highs dropped relatively more in the first stress session. The opposite happened to hand temperature under stress; lows dropped significantly more, especially in the control group. On rotary pursuit the differences seem to have more to do with the baserate performance under room temperatures than under stress. Lows started with a higher mean performance and, under stress, declined to about the same level as the high susceptibles.

The evidence clearly supports the assumption that stress is debilitating, but it also offers information about the importance of susceptibility. The stressors had the predicted effects on all groups and almost all measures, but these effects sometimes differed systematically and unexpectedly among groups. Evidently, some fundamental differences between people who are high and low in hypnotic susceptibility dispose them to respond with different degrees of impairment to the same amounts of stress.

The basic hypotheses were that self-hypnosis training would reduce stress-produced decrements in performance and physiological reactivity, and would do so more effectively among high than among low susceptibles. These hypotheses were supported in part, but the results are complex and sometimes equivocal. Some measures showed a training effect, some did not, and some showed the reverse of the expected effect, both independently and in connection with susceptibility.

The hypothesized effects of training and Training × Susceptibility interactions were sometimes wrong and always oversimplifications. Training did have some effects but not straightforward ones. It did not affect heartrate, chest temperature, and core temperatures, and its evident effects on shivering and basal skin resistance, though tending in the direction of the hypothesis, were undependable. Back temperatures and foot temperature seemed to be affected negatively by training, the latter reliably so; none of the indicated training effects interacted with susceptibility.

Hand temperature results supported the second hypothesis, but with no independent training effect and only small differences between groups. Vigilance showed a clear training effect, as per the first hypothesis, but no interaction with susceptibility, as per the second. Continuous rotary pursuit showed a training effect interacting with susceptibility, but it was low susceptibility that benefited from training, not high, and rotary pursuit trial blocks showed no significant effects at all.

Among the most powerful results were those pertaining to hypnotic susceptibility. Not only did susceptibility interact with the baserate measures of relatively stressed and unstressed conditions, but it frequently showed significant independent effects. Hypnotic susceptibility influenced at least four of the 11 measures significantly and tended to have some effects in connection with another five. Overall, high susceptibles had lower shivering rates than lows, lower back tem-

peratures, lower foot temperatures, and higher hand temperatures. Their chest and core temperatures tended to be lower. The mean heartrate of high susceptibles was 3.5 beats per minute faster than that of low susceptibles and their mean basal skin resistance almost 3 K higher, but neither of these differences was significant. Finally, they tended to do worse on rotary pursuit than did low susceptibles, but this difference was seen only on trial blocks, not on continuous performance.

It is quite clear that reactions to hypnotic training cannot be predicted merely from knowing hypnotic susceptibility, which is the main reason training effects were so ambiguous in this study. Training was variably effective as a stress resistance technique; its efficacy was clear and pronounced on vigilance performance, but on others it had no appreciable effect. Also, susceptibility and training interacted significantly on some measures so that training tended to work better with one subject group than another, sometimes favoring low and sometimes high susceptibles. The general implication is that failure to distinguish the subjects in terms of susceptibility may actually obscure training effects. Without a doubt, all research on hypnotic effects should take into account individual differences among subjects and should evaluate hypothesized effects in terms both of high and low hypnotic susceptibility.

Providing Health Care Through Mental Hygiene Clinics

Roy M. Barber

Increasing costs of hospitalization have led some physicians to believe there should be greater emphasis on outpatient facilities. Outpatient care is much less expensive and does not deprive the patient of the supportive influence of the home.

The Mental Hygiene Clinic of the VA Hospital in Memphis was opened in 1966. Within 1 month the staff, consisting of a psychiatrist, psychologist, social worker, and secretary, were seeing 328 veterans. The patient load doubled from 1967 to 1970, and during this period the social worker and psychologist left the staff. Some plan was required to deal with the patient load. The new Chief of Psychiatry evolved a system of mailing medications to patients whose illness was in fair remission. Some patients then came to the clinic only once every 2–3 months, thus reducing appointments from 631 to 380 per month. Each patient then had time to be evaluated and to work on problems when he saw the psychiatrist.

The chief goal of the clinic is to restore the mentally disordered person to his optimal level of physical health, mental functioning, social adjustment, and vocational performance in his community. Goals must be individualized. Some patients may work full time and remain functional at home. From the initial contact, the patient is made aware of the goal of adjusting well enough to remain outside the hospital and functional in his community.

Mental stabilization and remission of symptoms have been attained largely with psychotropic drugs, crisis intervention, and brief psychotherapy, with limited use of bibliotherapy and relaxation therapy. Social adjustment is promoted by conferences with wives and close relatives. Occasional family counseling and marriage counseling is arranged.

All patients are encouraged to do some work. Young unemployed veterans take vocational training or complete their schooling. Those who are unable to work in a competitive society are made acquainted with volunteer work which they can perform in the hospital and community. An incentive therapy program has been started in Manual Arts Therapy for those who have psychological and financial needs, and local industry has cooperated in this project. Approximately half the patients are employed, which disproves the claim that no one will hire a person who has been mentally ill.

With the therapy available in the clinic, mentally ill veterans have tolerated severe stress without requiring hospitalization. One man tolerated loss of his job, severe mental illness of his mother, and the interracial marriage of a child, all within a few months. Several have tolerated the serious injury or death of a son in Vietnam.

The mentally ill outpatients seem to need the reassurance that a psychiatrist is available if they need him. These patients travel 200 miles to see a doctor they trust, even for a 15-minute conference.

It is hoped that a Day Treatment Center and a Day Hospital soon will be activated to provide a wider range of therapeutic modalities for outpatients.

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The Pursuit of Peace

Jerome D. Frank

In the past few years, man himself has become the greatest danger to his own survival. We are in danger of exterminating ourselves in at least three ways—overpopulation, pollution of the environment, and nuclear war. Like Charlie Brown, I worry about one thing at a time, and so have concentrated on avoiding nuclear war, which is the most pressing and immediate threat to humanity.

In the past, to conquer a country all you had to do was to defeat its army. Now, thanks to the rising level of education and communication, people have become politicized and a nation can maintain control of another only by subduing its whole population. Also it is no longer possible to limit the repercussions of conflict. A world public opinion seems to be emerging which exerts a constraint on the unbridled application of force by any nation. Finally, any war can escalate into a nuclear exchange.

So one of the major problems of our time is how to devise other means of preserving national security and influence as resort to force becomes unusable. I shall consider the dangers in reliance on armaments as the mainstay of national security. In doing so, I shall confine myself to psychosocial aspects of the problems, recognizing that economic, political, and military aspects are equally or more important.

Humans change their ways very slowly in response to changed conditions. When faced with a new problem, they try to make it look like an old, familiar one and deal with it in the same way. So national leaders are committed to superior violence as the guarantee of national security. If one looks at the world picture, arms budgets have increased 30 percent in 3 years, 1965–68. The complacency of our citizenry would be hard to understand unless one remembers a psychological principle—habituation. We were very concerned about nuclear danger 20 years ago, but having lived with it so long, we have become inured to it.

Although reliance on superior force as the final arbiter of international conflict is becoming obsolete, the problem remains of protecting one's country against a hostile one that has the power to destroy it and whose intentions are distrusted. The traditional way has been to try to deter the other country from attacking by outarming and threatening it with dire consequences should it do so. To date, national leaders have found nothing better. So, I should like to examine some of the psychological aspects of deterrence which explain why it has never succeeded in keeping the peace for long and is less capable of doing so in today's world.

The basic principle of deterrence is the effort to control the behavior of someone by the threat of punishment. This is a widespread and legitimate form of control. Inflicting punishment or, more often, threatening to do so is the means whereby group animals demarcate their territories and establish dominance hierarchies, both of which are necessary for the group's survival. It also plays an important part in the rearing of children. Although one cannot jump from child-rearing to international behavior, some of the same psychological principles seem to be involved.

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To be effective, the threat of punishment must be believable. The parent must be prepared to carry out the threat. If a child disobeys with impunity, soon he will cease to take the threat seriously and it will cease to deter him. The best way of making a threat believable is to carry it out at least once. Here, we see a problem with a nuclear threat.

A more subtle component of believability is that the threatened punishment must seem roughly commensurate with the crime. An adolescent may be deterred from staying out after midnight if the punishment is to be deprived of the use of the car. But, if the parent threatens to shoot his son if he is not back before midnight, the son might be somewhat skeptical.

One more consideration is that although punishment will usually stop the behavior against which it is directed, it does not change the attitude underlying the behavior, except to make the victim angry and resentful. So, the child abstains only as long as the threat continues, but will resume his naughtiness whenever he thinks he can get away with it. However, punishment can produce a change in attitude when the child accepts the parents' standards of right and wrong; that is, when he feels that he deserves it. Then he becomes contrite instead of resentful. Unfortunately, nations believe themselves to be in the right, so punishment is never felt to be deserved. Hence, characteristically, after each war the loser starts plotting revenge, thereby planting the seeds for the next one.

Finally, successful deterrence depends on a cost-benefit analysis because carrying out a punishment involves some cost. For a threat to be credible, the cost to the deterrer of carrying out the threatened punishment must be less than the cost of letting his opponent get away with the forbidden act. When a father says, "This hurts me more than it does you," he is speaking nonsense. If the punishment hurt him more than the child, he would not carry it out. Cost calculation does not arise in the parent-child situation because the power distribution is so unequal. Cost of punishment is cheap because the child cannot effectively retaliate. Of course, skillful children learn to intimidate their parents by other techniques such as a display of injured feelings or withdrawal of affection.

When both sides are roughly equal and able to retaliate in kind, the effort to control behavior by deterrence becomes tricky, because then the calculation of costs is uncertain. This puts a premium on becoming stronger than the opponent, offensively and defensively: offensively to convince him that you can inflict more damage than he is willing to take if he defies you; defensively to convince him that he cannot damage you sufficiently in return. So the policy of deterrence creates an arms race.

One more component is emotional tension. Since successful deterrence depends on a calculation of relative risks and gains of different actions, it breaks down if one of the parties stops calculating, and this can happen if emotional tension gets sufficiently high. In short, if leaders on either side get sufficiently desperate to risk the destruction of their nation rather than give in to the other, the jig is up.

A final feature of mutual deterrence is that it tends to perpetuate itself. The situation is analogous to "aversive conditioning." This involves training an animal to press a lever, let us say, every 3 minutes, to avoid a shock. Once the habit is established, the shock machine can be turned off, and he will continue to press the lever

because he will not risk getting the shock.

With humans, the problem of relinquishing deterrence is compounded by the need to justify oneself. The more effort and expense involved in a course of action, the more one has to convince oneself that it is necessary to justify the cost. Thus, the failure of a threatened danger to materialize has to be attributed to the deterrent, even if the danger never existed.

Until the advent of strategic nuclear weapons, the maintenance of intermittent peace through a policy of mutual deterrence was compatible with human survival, and even reasonably tolerable because the resulting wars were not unbearably destructive. In a nuclear age, a nation cannot make such a test against a nuclear power without experiencing disaster.

This creates a state of perpetual uncertainty as to the opponent's capabilities and one's own. No reliable calculations of relative strength is possible. From the standpoint of offensive power, there is no prospect of achieving meaningful superiority once both sides have achieved "assured destruction potential"—that is, the ability to inflict intolerable damage on the other after sustaining the other's full attack.

The possibility of calculating relative strength could be realized if a successful defense against these weapons were achievable. I should like to bring up some psychological considerations suggesting that it is not. The central one is that the same mental processes that devise a defense are thinking of ways of circumventing the defense. The defender is at a further disadvantage because he does not know against what to defend until he sees what the attack is going to be, so that he is always a lap behind the attacker. As the result, no defense against any weapons has ever been much good. Since conventional weapons were relatively ineffective, even a poor defense was sufficient. Because of the destructive power of nuclear weapons, a defense would have to be practically 100 percent effective.

The situation is little better when one looks at the possibilities of passive defense—a shelter program against fire, blast, and radiation. There are three problems about shelters: getting in, staying in, and coming out. With respect to getting in, only through the strictest discipline could chaos be prevented. Many people have admitted that they would be willing to kill to get in or to stay in. Once in the shelter, life would be difficult, and again unless the strongest leadership were exerted, chaos would result. In a community shelter, among the psychological hazards would be intermingling of people of different classes and races, the worry about missing family members, and the fact that one symptom of radiation sickness is vomiting, which is psychologically contagious. When this is compounded with uncertainty as to how long one would have to stay in the shelter and what the world would be like on emerging, the psychologically traumatic effects would be severe. For those who survived, they would be coming out into a devastated world, probably radioactive and without available food or water. One cannot assert that no one would survive such an ordeal, but it seems safe to say that the number of deaths of those who succeeded in finding shelter would be greater than calculations that ignore the psychological complications have anticipated.

The greater the destructive consequences of carrying out the threat, the more one has to exaggerate the significance of the event to be deterred. This returns to the point that the punish-

ment must be commensurate with the crime. If the punishment is enormous, then one has to convince oneself that the crime to be deterred is equally terrible. Since the attempt to carry out a nuclear threat would amount to a murder-suicide pact, only a vital threat to a nation's survival could justify it.

These measures are aimed at maintaining the will of one's own side to undergo the sacrifices required to maintain a deterrent posture. Even more tension-producing are the efforts to convince the other side of the credibility and capability of the deterrer. Perhaps, the most serious effect of the attempt to do this is its stimulus to research and development, for each side fears that the other may achieve a breakthrough that would allow it to attack with relative impunity; the more money each side pours into research and development, the greater these mutual fears become.

Arms buildups by nuclear powers stimulate the spread of weapons since nonnuclear powers cannot tolerate a monopoly of these weapons. Whether the Nuclear Nonproliferation Pact will be able to halt this process is doubtful unless the nuclear powers begin to cut back their own stockpiles.

In an atmosphere of mutual suspicion and fear, actions which one side regards as defensive are seen by the other as provocative. One effect is that each country tends to overestimate the warlike preparation of the other. In short, the supreme irony of nuclear deterrence is that although it is designed to avoid nuclear war, its effectiveness depends on the possibility of resorting to nuclear war. Strategic analysts have compared mutual deterrence to the game of "chicken," in which adolescents drive at each other at top speed, each with the left-hand wheels over the white line. The one who swerves first is the loser. The problem is how to convince your opponent that you are more willing to be destroyed than he is, so that he will swerve first. One way is to remind him of other times that you have won or have demonstrated your toughness. Another way to try to convince your opponent that he should back down is to bluster. A more drastic measure involves tying one's own hands to leave the last clear choice to avert disaster to the other. In "chicken," this could be achieved by locking one's steering wheel in place and making clear to the adversary that one has done so. This type of thinking has led to the notion of creating a Doomsday machine that would go off automatically if our country suffered a nuclear attack.

It is inconceivable that nations will relinquish the efforts to control each other's behavior by threats until some other effective methods emerge. The task of our generation is to devise other means of keeping international violence within acceptable limits until these are devised. They will undoubtedly involve the more imaginative use of other forms of power such as psychological and economic, and especially a new system of international relations. This will, in turn, require the development of new institutions analogous to the peacekeeping ones that maintain the stability of domestic societies, notably courts who can back their decisions by sanctions. The creation of these institutions is a job for political and military scientists and jurists, but I believe that students of human behavior also have something to contribute.

Adolescence: A Study of Stereotyping

David M. Smith

A great deal of empirical work on stereotyping has been carried out in the field of race relations. The purpose of this paper is to consider stereotyping in relation to another area: adolescence.

Studies of radical stereotypes show that stereotypes have a considerable ability to resist change and to remain unaffected by new information. To argue that they are never subject to change is to misunderstand the import of empirical findings. Stereotypes are subject to change, but change normally occurs only in certain directions and tends to result in modifications to or extension of the stereotypes rather than in their total rejection.

Adolescent Stereotypes

The definition of adolescence cannot be divorced from those of childhood and adulthood. People process through each status over time. Since the procession is temporal there tends to be an association between each status and a particular age-range. In societies with *rites de passage* the relationship between age and status is formally defined. In Western society the connection is less clear, and the status of adolescence becomes more relevant to the actor than does his actual biological age.

The status of adolescence in Western society encourages the development among adults of a stereotype of adolescence as a category, typified by irresponsibility. Adolescents are seen as irresponsible in the negative sense that they do not play adult roles, rather than that they play roles which are specifically seen to be irresponsible, although discrepancies between adult and adolescent expectations of adolescent behavior may produce the latter as well.

People also hold numerous other stereotypes which relate in part to adolescents. These may relate to subgroups within the general category of adolescence or to other groups who include numbers of young people. The image of "Mods" and "Rockers" exemplified in their description as "long-haired mentally unstable petty little hoodlums, these sawdust Caesars," is one such stereotype. Similarly the drug-taking, politically disruptive, long-haired image of the hippies, and the sexually immoral, politically apathetic, unwashed image of the beatniks of the 1950's are distinct stereotypes. These stereotypes frequently relate to observable criteria such as clothes and hair styles.

Stereotypes also develop about groups of people who, though not necessarily adolescents, are associated with adolescents in the eyes of observers. "Youth Culture" has little to do with youth. The kind of behavior associated with this phrase is typical of certain occupations—bohemian business, show business, and some working-class occupations. Certainly there appears to exist in people's minds stereotypes of what pop singers are like, and the assumption is frequently made that if pop singers engage in deviant behavior their followers will copy them.

These stereotypes differ from the stereotype of adolescence in that initially they are associated with other criteria. Neither is their adolescent status necessarily seen as the most relevant criterion. The observer receives

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information about adolescents and classifies it either as being appropriate to adolescence in general or to some adolescent only. If it is concerned with the former, the information is related to the stereotype of adolescence already held, and confirms or modifies it. In practice, information is perceived in such a way that it tends to confirm the stereotype or components of the stereotype. Information which is classified as being about some adolescents is related to other appropriate stereotypes. Hippies are not necessarily seen to be typical of all adolescents, but their "irresponsible" behavior may be used as an illustration of the irresponsibility of adolescence in general.

As long as criteria other than age are important for the maintenance of stereotypes associated with some adolescents, this situation is likely to remain. There is evidence to suggest that the adolescent element of these stereotypes is becoming more important. This can be seen in the increasing irrelevance of observable criteria like clothes and hairstyles. When beatniks wore their hair long and dressed sloppily, they distinguished themselves as a deviant group. The range and flamboyancy of adolescent dress today makes such a distinction less useful. What is more, the appearance of those adolescents commonly identified as deviants spreads throughout this range. Hippies wear their hair long, but other deviant groups are recognizable by their short hair. The leather jackets and military emblems of Hell's Angels differ from the flowing robes of the hippies and from the braces and boots of skinheads. More subtle distinctions, like those of social status, are similarly inappropriate. The supposedly working-class origins of the skinheads contrasts with that of the hippies and students who are predominantly middle-class. As these criteria become confused, age increases in value as a means of categorizing individuals. The young look young; but more than that, they tend to dress in a manner distinctly adolescent.

Perhaps more important is the sheer volume of information about adolescent behavior. Each person receives so much information about the deviant activities of adolescents that it becomes difficult to separate the irresponsible actions of these diverse groups from the stereotype of irresponsibility of adolescence as a whole. There is a tendency for the stereotypes associated with subgroups of adolescents to impinge upon the general adolescent stereotype. The implications are considerable because adolescent irresponsibility becomes associated with a whole host of specific irresponsible and deviant acts more serious in the eyes of the adult world than the stereotype of irresponsibility implied.

Sources of Information about Adolescents

Information about adolescents derives from three main sources: direct experience of behavior, interaction with other adults, and the mass media.

Information from direct experience is subject only to the interpretations placed on it by the recipient. Other information has been interpreted by its source of origin in terms of the stereotypes prevailing in that source. Each person as well as receiving information also feeds back information to others. This process applies not only to individuals but also to the mass media. In this case the process is more complex and involves a large number of people but it is essentially similar. Mass communicators, like everyone else, hold stereotypes and interpret, classify, and feed back information according to their stereotypes.

Direct experience is probably least

important for most people, since each person comes into contact with a small proportion of the total amount of behavior which he is aware is going on. Information received in this way may be highly influential. The man who is beaten up by a group of skinheads, or whose car is burned in a student riot, is likely to have his stereotype reinforced in such a way that it is not influenced by other sources. Even in these circumstances, the stereotype which is reinforced is likely to relate to a subgroup of adolescents, since the chances of involvement with a number of adolescent subgroups is slight. Direct experience may be more important for people who regularly come into contact with adolescents. Teachers and youth workers hold rather different stereotypes of adolescence from other people. However, evidence does not point to frequent contact as an important element in modifying stereotypes.

Numerous studies have shown the importance of interpersonal relations as an influence upon attitudes and behavior. Unlike direct experience, the information the person receives has already been processed by others in terms of their own stereotypes and, if the stereotypes are similar, appears more relevant.

The greatest amount of information comes from the mass media. Through the process of mass communication people are able to receive vast amounts of information about behavior occurring over wide and diverse geographical areas. When the deviant behavior of numerous groups of adolescents is presented in close succession, the audience begins to make links between stereotypes appropriate to these groups and the stereotype of adolescence itself. Student riots in Japan, draft dodgers in America, hippy sit-ins in London, and the delinquent behavior of skinheads, all come to be seen as aspects of the irresponsibleness of adolescence. This is not to say that mass communicators deliberately set out to derive stereotypes. It is rather the nature of the presentation of information by mass media which encourages stereotyping among the audience. The mass media also have an indirect influence. Since most people receive a great amount of information from the mass media, in interacting with other adults they receive other people's interpretations of information deriving from the mass media rather than information based on their own direct experience.

The Stereotyping Process: An Illustration

I will illustrate the model of the stereotyping process with an example —the press reaction to drug charges against two of the Rolling Stones pop group and their subsequent trial. This case is well documented and I have drawn largely upon material reported in the *Rolling Stones File* by Tim Hewat. The pop industry as a whole, I have argued, is associated by adults with adolescence. Among pop groups the Rolling Stones are interesting in that the group's image was related to the rebelliousness of youth, and early in their career they had been described as an "anti-parent symbol." The stereotype of pop singers as deviants is epitomized in the press reaction to them prior to the trial. Their own mildly deviant behavior had received publicity, as had the "riots" of their fans. I am not concerned with the details of the trial nor its outcome. What is relevant is the reaction of the press to the trial. Whether articles were in favor of, or against the sentences imposed, the same underlying assumption appeared: that the behavior of these pop singers was represent-

ative of the behavior of a large number of adolescents. Some newspapers related the Rolling Stones behavior to a general drug-taking problem among youth. Other newspapers extended the relationship to include other stereotypes involving yet more adolescents. *Queen* magazine related drug taking explicitly to pop music, to dress and, by implication, to adolescence as a whole; the article quotes a number of pop stars and their managers, most of whom appear to favor the use of drugs.

Although the first National Opinion Poll to be published after the trial reported that the majority of young voters (people under 21 were not interviewed) felt the sentence on the Rolling Stones to be too lenient, the press had begun to relate drug taking to a variety of other deviant or potentially deviant areas of adolescent behavior. The *New Statesman* related drug taking to numerous other deviant behavior patterns, and discussed them all in relation to adolescence as a whole.

Implications for Adolescent Behavior

Stereotypes of adolescence develop through a complicated process of interpretation of adolescent behavior rather than deriving directly from behavior itself. Stereotypes are only marginally related to behavior. Nevertheless the stereotyping process has implications for changes in patterns of adolescent behavior. How adults regard adolescents will influence their interpretation of what adolescents are doing and the way in which they interact with them. Although feedback plays a limited part in determining what the mass media portray, there tends to be a connection between what is shown on mass media and what their audience believe. Merely by holding stereotypes, without necessarily acting upon them, people may encourage the use of even more derogatory stereotypes on the mass media. In situations of contact with adolescents, stereotypes are likely to have a direct effect upon adolescent behavior. Associations between the stereotypes of adolescence in general, and stereotypes relating to deviant adolescent groups, may result in adults attaching deviant labels to adolescents in general, and the young may find themselves increasingly being pressed into deviant roles.

The impact of the stereotyping process upon adolescents' own stereotypes of adolescence is worthy of consideration. Studies of drug addicts suggest that addicts hold different stereotypes of users than do other people. Adolescents however are in a different situation. The category "adolescent" is not defined by behavior in the first instance. The adolescent may hold a stereotype of adolescence which he does not necessarily relate to his own behavior. He may associate himself less with adolescents than with other reference groups—ethnic, social class, geographical area, or even a subgroup of adolescence: hippy, skinhead, etc. What is more, adolescents have greater access to some sources of information than have adults. There are important differences in emphasis, but the influence of adolescent stereotypes of adolescence upon their behavior is worthy of consideration in future research.

Mental Health and the Law

Ethical and Legal Aspects of Behavioral Instrumentation

RALPH K. SCHWITZGEBEL

Principles for directing development and use of behavioral devices are not well developed. The field is a new one; guidance, therefore, comes by analogy to related disciplines. Also, concern is generally directed toward research and developmental aspects of new devices rather than manufacturing and sale of existing devices. In the following discussion, problems in the area of research and development are presented in broad outline.

Experimentation with Devices

Ethical and legal considerations in experimentation with new behavioral devices are similar to those found in psychological research and medical investigations. Many principles now applied in psychological research originally were derived from standards proposed by medical organizations. The Nuremberg Code, the Declaration of Helsinki, and related codes contain substantial areas of agreement and provide a suitable starting point for consideration of basic principles.

Major codes governing experimentation with human subjects mention informed consent of the subject as prerequisite to the conduct of an experiment. Food and Drug Administration regulations emphasize the nature of the information that must be given to the subject so that his consent is informed. The Public Health Service allows the research institution to determine "appropriateness" of the "informed consent" obtained by the experimenter.

The requirement of informed consent is more rigorous when there is risk to the subject, but little or no therapeutic potential for him. When there is little or no risk, the requirement of consent may be relaxed somewhat. The use of electronic devices to observe or elicit information presumably could be included among those procedures that do not require fully informed consent, unless the device alters the status of the subject and involves risk to him.

Consent should be voluntary and should not involve duress. "Voluntariness" assumes that the subject understands potential risks and benefits, although he probably cannot know all risks and benefits because some uncertainty is inherent in experimentation.

Sensitive areas where no generally accepted guidelines have been formulated involve the consent of minors and mentally incompetent persons, the administration of placeba and the use of related control procedures, and the employment of lifesaving but high-risk procedures. Exceptions to the principle of consent are few, but 1962 amendments to the Federal Food, Drug, and Cosmetic Act do not require consent when experimenters "deem it not feasible or . . . contrary to the best interests of such human beings." The nature and limits of these exceptions appear to be related to emergencies or serious disease situations.

There is agreement among major codes that all unnecessary, harmful effects of experimentation are to be avoided. Although all risks cannot be known, the experimenter should be familiar with those commonly known

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among experimenters doing similar work, and he should avoid all risks that are not necessary.

Persons developing and studying new behavioral devices should be aware of risks, such as electric shock or malfunction, that may be associated with a device. Such risks are to be eliminated or minimized, with the subject knowingly and voluntarily assuming the residual risk. If neither alternative is available, the experimenter should seriously question whether the experiment ought to be conducted.

Increasing emphasis has been placed on protection of the subject's privacy so that information obtained during the course of an experiment will not be used to harm him. Some States provide special statutes to safeguard the confidentiality of research information, and such statutes generally relate to matters within the purview of public health. Within the judicial view, confidential records may be inspected by the administrator of the institution responsible for the research if confidentiality is maintained.

FDA Regulation

Procedures used by the Food and Drug Administration to regulate the sale and use of drugs and cosmetics are considerably more detailed and well developed than those used to regulate medical devices, but legislation is being proposed that would regulate devices in much the same manner as drugs. Hence, it may be useful to consider current procedures as they apply to devices.

Procedures—The original Pure Food and Drug Act of 1906 was aimed primarily at preventing interstate commerce in harmful drugs. In 1938 the Federal Food, Drug, and Cosmetic Act was passed which required that new drugs be cleared by FDA for safety prior to sale in interstate commerce. In 1962, after the thalidomide crisis, amendments were passed which required drug manufacturers to demonstrate safety as well as effectiveness of a new drug prior to its approval.

In the 1938 Act, devices that were harmful or which were accompanied by false or misleading claims could not be marketed in interstate commerce. Devices now may be marketed without preclearance or approval by FDA; once they are sold in interstate commerce, however, FDA may examine the devices and related data to evaluate their safety or labeling. Unsuitable devices may be seized and their manufacturers and agents prosecuted. Trends in Congress and in the courts appear to be moving toward preclearance for new devices.

Current thinking on regulation of devices by FDA is embodied in medical device bills now before Congress. Similar bills have not passed before, but impetus is mounting with the rapid increase in the use of critical medical devices such as cardiac pace makers and artificial organs.

From the judicial viewpoint, there seems to be a similar extension of FDA regulatory procedures to cover devices. The definition of "new drugs" has been extended to include certain new devices, thus requiring their preclearance.

History of FDA device legislation suggests that the courts may be moving toward distinguishing drugs from devices on the basis of the physical, mechanical action of devices in contrast to the physiological action of drugs.

In view of present confusion about classification of drugs and devices, it might be useful for the researcher or manufacturer in the area of behavioral devices to obtain some determination from FDA as to the classifica-

tion of the article if he is not certain. This might preclude legal liability which could arise should the article become labeled by FDA as a drug without having been precleared.

Policy—Movement toward preclearance and investigational supervision of medical devices and equipment for behavior therapists is just beginning to develop. Even procedures for removing from interstate commerce devices that are harmful or mislabeled are only beginning to be used adequately.

Present regulatory practice aims to protect public health in such a way that availability and development of new devices is not unduly hampered. To achieve this, FDA has a very wide range of discretionary authority. Also, because most drugs and devices are involved in some aspect of interstate commerce, the jurisdiction of FDA is quite comprehensive.

Not all devices and drugs can be absolutely safe; side effects and hazards necessarily are involved in the use of some therapeutically effective articles. But, as a class, behavioral devices are not likely to be as hazardous to the users as are medical devices per se. Also, many behavioral devices would not seem to lie within the purview of the Federal Food, Drug, and Cosmetic Act, for the Act is directed toward health, not behavioral problems. But, if behavioral devices are developed that present potential hazards to health, policy may quickly change.

Product Liability

The area of product liability is undergoing rapid change, and since so little law exists on behavioral devices, understanding must be derived largely from current trends affecting medical and related articles.

Breach of warranty and negligence—The breach of warranty action by the plaintiff is based upon express or implied assertion by the manufacturer or seller that the article is suitable for its intended use, and the action requires a contract between the supplier of the article and the person injured. This privity of contract requirement usually means that a patient cannot bring an action against a manufacturer for injury resulting from a device used by a physician, because the physician was not a manufacturer or seller of the device to the patient. There has, however, been a recent tendency to relax this privity requirement in regard to patients and household members.

In a breach of warranty case, the plaintiff does not show that the manufacturer or seller was negligent in construction or care of the device; he shows that the article was not suitable for its intended use. Negligence is the basis of a different legal action. If the manufacturer and seller are negligent, they may be liable to the immediate purchaser and to any subsequent user with no privity of contract requirement. Manufacturer and seller are held to a standard of reasonable, due care, and this standard may be determined by Federal or local statutory requirements of FDA regulations.

The manufacturer of a device must also inspect the device for obvious or latent defects. Sellers are often required to inspect for obvious defects, and there appears to be a trend to impose a duty upon a user to inspect for defects that may harm patients. The manufacturer and seller should provide proper labeling that includes suitable directions.

Strict liability—The two concepts of breach of warranty and negligence appear to be merging into a theory of strict liability imposing liability upon any person who sells a product that is defective or unreasonably dangerous

to the user or consumer. The seller may be liable even though he has exercised all possible care in the design, manufacture, and sale of the device. The physician or psychologist, as a user of a device for therapeutic purposes with a patient, should not be liable under this doctrine.

Three approaches to limiting liability are being developed: (1) manufacturer and seller are not liable if the device has been substantially damaged after being sold; (2) they are not liable for harms that cannot be reasonably foreseen; (3) they are not liable if the injured party has used the product in a manner not intended by the manufacturer and/or seller.

Some products of a medical or therapeutic nature are inherently dangerous, for example, some vaccines. To preclude their use by attaching strict liability would subject the public to even greater risks of harm. If such a product is properly developed and is accompanied by proper directions, it should not be considered "unreasonably" dangerous, but the user must be warned about the risks involved. This standard would also seem applicable to new or experimental products or devices used by behavior therapsits.

Policy—The manufacturer, seller, and researcher are to protect the public from all unnecessary harm produced by their devices. But not all harm can be foreseen and sometimes risks may be necessary, as in the case of overriding therapeutic necessity or the assumption of risk by the person using the product when he is fully informed of reasonably foreseeable risks. This obligation on the manufacturer or seller is known as the duty to warn and is imposed even though the device is properly manufactured and not defective. The label should be explicit as to hazards both within and, to some extent, beyond the area of intended use and should suggest safeguards.

Possible hazards in using certain behavioral devices are not only electrical but also chemical, structural, and psychological. Generally, courts have been reluctant to award damages to plaintiffs for mental suffering in the absence of physical harm, but there is some trend to permit damages when mental suffering is very clear and exceptionally intense.

Finally, some consideration should be given to design and quality of the device so that it can function safely and reliably over a reasonable period of time, and this may require additional cost to the manufacturer in terms of design, testing, and material. In matters of critical medical or psychological importance, additional consideration should be given to the development of internal warning systems, redundant circuits, and easily inspectable and replaceable components.

Mental Health News Digests

Mental Health News from Kansas

Alcoholics admitted to Larned State Hospital find a variety of programs to aid them in regaining permanent sobriety. Larned was the first State hospital in Kansas to set up a 24-hour program for alcoholics as part of its alcoholism unit. The unit, which began 3 years ago, also includes a day care program and an Alcoholics Anonymous program. Patients in the AA program live on their respective wards, receiving psychiatric treatment as prescribed, and are assigned to attend AA meetings on a regular basis.

The unit offers all patients group therapy, activity therapy, and vocational rehabilitation.

Residents of the closed security-intensive treatment cottage at the Girls Industrial School, Beloit, are learning to deal with their emotional problems by gaining self-control. To earn privileges such as keeping toilet articles in their rooms, the girls must show responsibility and control in school and during free time. During the course of the treatment program, the girls often discover that for the first time they can trust themselves and others. The newest activity is a "Sing-Out Group," which helps the girls express themselves through learning and performing popular songs.

A new staff position of juvenile probation psychiatric technician has been established at Topeka State Hospital. The job will help fill the gap between the juvenile offender and the courts, his family, and his community. Technicians will be assigned such duties as visiting the Juvenile Court to obtain specific information from the parole officer and juvenile judge; visiting the juvenile in jail or at home, talking with his parents; assuring that the conditions of probation are being met; and finding jobs for parolees. It is hoped that the psychiatric technician program will open up new careers for middle-level mental health workers.

A fourth revised edition of *Standards for Treatment Centers in Kansas* is being prepared by the Board of Social Welfare, in cooperation with interested citizens and organizations throughout the State. Since the third edition was published, the number of treatment centers has increased, the community mental health statutes have been expanded to all for the establishment of community mental retardation centers, and changes have occured in the funding and licensing of centers. The new *Standards* will emphasize the relationship between mental health centers, mental retardation facilities, and alcoholism treatment units, and will define the services to be provided by these facilities. (From *Taproots* Kansas State Dept. of Social Welfare).

Annual Meeting of the American Orthopsychiatric Association

Over 8,000 persons working in the mental health field registered for the 46th Annual Meeting of the American Orthopsychiatric Association in Washington, D.C. on March 21–24, 1971. The Association, founded in 1924, is a national organization of more than 3,300 professionals in the behavioral, medical, and social sciences dedicated to a multidisciplinary approach to mental health problems. Its annual meeting is the largest interdisciplinary meeting of scientists and professionals in the mental health field.

The meeting theme was "The 70's —Critical Issues for the Mental

Health Field." Among the topics discussed were the President's Commissions on Civil Rights and on Campus Unrest, war resisters, problems of aging, street clinics, crises in the schools, and black women. Other major program events were concerned with drug abuse, black and white interaction, group therapy, and abortion.

Dr. Eli M. Bower, Professor of Educational Psychology at the University of California at Berkeley was installed as the new President. The President-elect is Charles H. King, Associate Commissioner for Intramural Services, New York State Addiction Control Commission, and Associate Clinical Professor at the Adelphi University School of Social Work.

New Children's Psychiatric Building for Massachusetts

The Hall Mercer Building, now under construction at McLean Hospital, Belmont, will help meet the critical need for children's psychiatric facilities in Massachusetts. The $2.3 million building, which forms part of the McLean Children's Psychiatric Center, will house a 40-bed inpatient residential unit serving emotionally ill children under age 13. A day care center, school, and clinical and administrative offices will be located in other buildings at the Center.

In designing the Center, emphasis was placed on using architecture as a tool of therapy. The structure of the buildings will enhance the operation of evaluation and treatment programs for emotionally disturbed children. As an affiliate of the Metropolitan Beaverbrood Community Mental Health Center, the McLean Children's Center will treat children from families of all economic levels.

Asian Regional Association for Vocational and Educational Guidance

A new international guidance group, the Asian Regional Association for Vocational and Educational Guidance, was established in November 1970 at the Chinese Guidance Association in Taipei. The first general assembly of ARAVEG included seven Asian countries: China, Hong Kong, Japan, Malaysia, Singapore, Thailand and Viet Nam. American guidance leaders who contributed to the establishment of ARAVEG were E. G. Williamson, Henry Borow, and Donald Super.

National Research Council Studies Problems of Society

A series of National Research Council Studies of Social Problems has been undertaken with support from a Program Initiation and Development Fund established 8 months ago by the Council of the National Academy of Sciences. Four projects are now underway with the fund's backing.

The NRC Division of Medical Sciences and the NRC Division of Behavioral Sciences have begun a study of the nature and dimensions of heroin use in the United States. The goal is to produce an assessment of the causes and the effects of currently used methods of treatment and control, of possible guidelines for measuring the effectiveness of treatment and control, and of research needs. The Division of Behavioral Sciences is also conducting an exploration into scientific questions and policy issues raised by problems of social disorder and social control. The NRC Division of Earth Sciences is examining problems of nonrenewable resources, (i.e., mineral and fuel resources). It is focusing particularly on environmental considerations in the exploration,

development and production of nonrenewable resources. The NRC Division of Biology and Agriculture is looking at problems of decisionmaking in consideration of such matters as pesticides, food safety, and renewable resource management. (From *News Report,* National Academy of Sciences, National Research Council, National Academy of Engineering).

Driver Education Task Analysis

The National Highway Safety Bureau has commissioned the Human Resources Research Organization to develop a set of driver-education objectives based on a comprehensive and detailed analysis of driver tasks.

As a first step, researchers, examined the types of situations that typically confront automobile drivers, and identified the appropriate behavioral responses—what the driver ought to do in these situations. These situations were studied in terms of a "highway transportation system" consisting of five major subsystems: the driver, his vehicle, the roadway over which he travels, the traffic he encounters, and the natural setting in which it all takes place. After examining the characteristics, and determining the appropriate responses to them, the researchers produced a list of more than 1,000 specific driving behaviors required of the competent driver.

Scientists continued the analysis to identify the specific behavioral elements involved in each task This analysis resulted in a set of 1,700 specific driving behaviors, grouped in a hierarchy of tasks. The final step in the driving task analysis was to prepare a set of task descriptions containing for each task: (1) a description of the appropriate driver behavior; (2) indices of criticality; and (3) related information about the behavior gathered in a review of earlier research.

These descriptions are presented in a HumRRO report to the National Highway Safety Bureau entitled "Driver Education Task Analysis: Volume I, Task Descriptions," which may be obtained from the National Technical Information Service, 5285 Port Royal Rd., Springfield, Virginia 22151.

HumRRO scientists are now developing a set of driver-education instructional objectives that are based on this analysis of the requirements of driving. When completed, this set can serve as a model for individual school systems to use in developing their own driver education programs.

Mental Patient Guide for Motor Agencies

Emotional disturbances of motor vehicle operators present medical advisory boards with their most difficult challenge, according to four physicians. The wide variety of psychological impairments, forms of treatment, and degrees of individual variation "make it difficult to define and especially to accurately assess the levels of emotional impairments," they said. Although responsibility for licensing motor vehicle operators rests with the State motor vehicle departments, licensing administrators rely heavily on recommendations of medical advisors in cases of possible physical or mental impairment making an individual a nonacceptable risk as a driver.

These four physicians recently prepared a guide for licensing emotionally disturbed drivers as a part of a monograph entitled "Driver Licensing Guidelines for Medical Advisory Boards," available from Robert Kerr, Assistant Information Officer, U.S. Public Health Service, 55 Ridge Ave., Cincinnati, Ohio 45213.

They believed the more numerous and more difficult cases are those per-

sons with illnesses such as schizophrenia, character disorders, and the affective reactions, as well as most of the psychoneuroses, who do not require hospitalization but are treated satisfactorily as outpatients. "It is valid here to evaluate the driver's license application on the basis of functional ability . . . individuals with an emotional erratic pattern, showing periods of irresponsibility, outward or inward aggressiveness, where distorted perceptual thoughts have been identified by accident investigators as potentially high-risk groups in motor vehicle accidents," they said.

Voluntary Action and Drug Abuse

Professionals in all fields of health and mental health have become intimately involved with drug abuse on the volunteer level. The free clinic as a new concept in the field of health services originated as a solution to the problem of treating drug abusers. Staffed by volunteers, free clinics offer medical services to the drug subculture in unique and unorthodox circumstances. Telephone services (hot lines) which offer 24-hour help and referral to drug abuse cases are now operating with the initiative and skill of community volunteers and service groups. Voluntary action in the area of drug abuse has become an integral part of public school life with students at all grade levels participating in prevention and education efforts. Parents have become involved in their own children's drug abuse problem and have joined both parent and parent-youth groups. The drug abuse subculture itself has made a significant contribution to the changing structure of voluntary action groups. The ex-addict who has ceased to be a drug abuser can be an important member of any drug abuse related voluntary action group. The ex-addict on a roster of speakers' bureaus can relate realistic information on drug abuse to large public audiences.

The expansion of voluntary action groups across the country has given rise to an overwhelming need for the coordination of resources, knowledge of program activities, and the exchange of information gained by the experience of others. Scientific research into the effects of drugs, patterns of use and effective treatment modalities has just recently begun on a large-scale basis. Volunteer groups need to be informed of research activities of other groups and successful ways of treating drug abusers.

The National Clearinghouse for Drug Abuse Information (NCDAI) has been formed to function as the center for information in the field of drug abuse. The Clearinghouse has worked with national, state and local groups involved in voluntary action. Further information describing various national voluntary action organization and the involvement of the Clearinghouse in these projects is available in the NCDAI Report Series 5, No. 1. This Report Series covers a variety of drug abuse topics and is published infrequently for people specifically concerned with drug abuse. Inquiries should be directed to the National Clearinghouse for Drug Abuse Information, 5454 Wisconsin Avenue, Chevy Chase, Maryland 20015.

Report of the WHO Expert Committee on Drug Dependence

The 18th Report of the World Health Organization Expert Committee on Drug Dependence has been published as Number 460 in the WHO Technical Report Series. This latest report of the Expert Committee is concerned primarily with current

approaches to treatment and rehabilitation of drug-dependent persons and to the prevention of drug dependence. The report reviews work of several international organizations involved in management of drug dependence and control of narcotics, and special attention is given to problems of withdrawal and maintenance in treating drug dependent persons. The "British approach" to heroin maintenance and methadone maintenance is described in detail, and bibliographies are included for both kinds of maintenance systems. The report includes a list of drugs under international naroctics control and stresses legal controls on drug distribution as one of the most important methods of preventing widespread drug dependence. Drug abuse prevention programs are discussed, and it is stressed that such programs should have realistic aims, incorporating legal controls plus educational and social measures designed to present appealing alternatives to drug use. While recognizing that consistent policy is desirable in the control, manufacture, and distribution of drugs, the WHO Expert Committee on Drug Dependence stresses that a truly uniform approach is not feasible and not really appropriate when one takes into account differences in socioeconomic and cultural factors across international boundaries that influence local drug-taking behavior. Nevertheless, it is important that countries having similar cultural patterns and values should exchange information and coordinate efforts in prevention and treatment of drug dependence.

The full report is available for $1.00 from the American Public Health Association, 1740 Broadway, New York, N.Y. 10019.

New Services in Pittsburgh

The *Western Restoration Center* in the Hill District of Pittsburgh has as its main function helping to meet the expanding problems of the geriatric and the chronically ill by providing diagnostic screening, short-term therapeutic treatment, realistic placement, and followup services.

The Center's patients include those currently applying for admission to public institutions and people who are applying for admission to private institutions for whom public financial aid will be required. They may be referred from a variety of sources including social agencies, hospitals, families, self-referral, boarding, foster, and nursing homes as well as other interested parties. The average length of stay for a patient is 5 months.

• The city of Pittsburgh has an official program specially designed to *keep the elderly independent* and assist the aged poor residing in and around public housing projects designated for their use.

The program, designed to help the elderly remain physically, socially, and emotionally able to participate actively in community life, was made possible through the combined efforts of public and civic agencies and the Pennsylvania Department of Public Welfare's Office of Family Services, Bureau of Special Services. Under provisions of the contract, a social worker is assigned to each housing area to provide necessary counseling regarding housing, income, and personal matters. The social worker trains and supervises human service aides and offers job counseling as related to employment and placement.

In addition to overall program supervision, a community resources coordinator is responsible for the development and maintenance of community resources vital to the

health and welfare of the aged residents. Plans are currently in progress to expand the program of services to a county area and eventually improve the welfare of an additional eleven thousand senior citizens.

New Day Care Center for the Aged

A $20,000 Federal Grant—the first of its kind awarded to a county mental health service working in cooperation with a State hospital—will be used to establish a new day care center in Ogdensburg, New York, for the aged of St. Lawrence County. The Center is the first step in an attempt to coordinate all mental health services in the County. Its goal is to delay or prevent the institutionalization process.

The Center will have access to the combined resources of the State hospital and the county mental health services. An outreach program will be established to insure better care for the rural aged, and an aftercare program will be developed to assist hospital patients in readjusting to community life. The program will accommodate about 20 elderly persons whose families need help caring for them but who do not require nursing home or hospital care. The cooperative nature of the program extends beyond official relationships with county mental health officers; involved in various ways are the public libraries, social service agencies, public health nurses, and the county's physicians. (From *Mental Hygiene News*—New York State Dept. of Mental Hygiene).

White House Conference on Aging

The White House Conference on Aging is currently planned to be held in late 1971. Its goal is to discuss the issues concerning the nation's aged population and develop a national policy on aging. Representatives from every State and nearly 400 national organizations are planning to participate in the conference. For further information consult the 1971 issues of *Aging* ($2 annual subscription or 30¢ single copies from Superintendent of Documents, Washington, D.C. 20402) or write to John Martin, Director, 1971 White House Conference on Aging, HEW-South Bldg., Washington, D.C. 20201.

Silver Anniversary Conference

A two-day conference honoring the 25th anniversary of the enactment of the National Mental Health Act will be held on June 28 and 29 in Washington, D.C. The conference will be sponsored by 17 health and mental health organizations, including the American Medical Association, American Nurses' Association, American Orthopsychiatric Association, American Psychiatric Association, American Psychological Association, American Public Health Association, Council on Social Work Education, Association of Medical Superintendents of Mental Hospitals, National Association for Mental Health, Association of Mental Health Administrators, National Association of Private Psychiatric Hospitals, National Association of Social Workers, National Association of State Mental Health Program Directors, National Committee Against Mental Illness, National Council of Community Mental Health Centers, National Institute of Mental Health, and National League for Nursing.

Each of the conference sponsors has appointed a Conference Coordinator. Inquiries may be directed to the Coordinator at the Associations or they may be addressed to: Silver Anniversary Conference Committee, National Institute of Mental Health, 5454 Wisconsin Avenue, Chevy Chase, Maryland 20015.

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